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FLIGHT

MAGAZINE

NOVEMBER 1961
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MOONEY MARK 21 FOR 1962

(See page 24)

". . our **BELL** *will more than pay for itself in one year."*

Today, businessmen demand that every tool and piece of machinery earn a profit through high time utilization and low cost of operation. And, like Mason Travis of Western Contracting Corporation, who operates two Bells, many businesses are proving that the Bell helicopter is a working piece of equipment with a fast profit payout.

As a flying tool, a Bell helicopter has no equal for profit performance . . with its world famous, land-anywhere flexibility and low cost of operation. It will pay off by reducing the transportation time of supervisory personnel between work sites from days to minutes . . by expediting delivery of cargo . . by hot-shotting emergency parts and repairmen to breakdown areas. And, a Bell helicopter will deliver this service around the clock because Bell's proven dependability reduces daily maintenance to a minimum . . provides up to 100,000 miles between major overhauls . . and operates at the lowest cost per mile of any helicopter.

Consider a Bell for your business. Write today for data and supporting case histories which will assist in your evaluation . . no obligation, of course. Write to Commercial Sales Manager, Dept. 411K, P. O. Box 482, Fort Worth, Texas.

bh **BELL HELICOPTER COMPANY**

FORT WORTH, TEXAS • A DIVISION OF BELL AEROSPACE CORPORATION • A TEXTRON COMPANY

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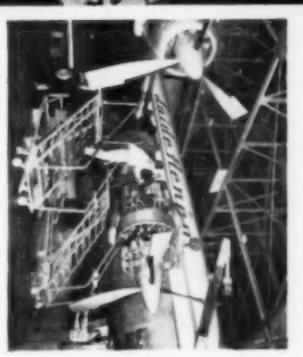

☆☆☆☆☆ When the magnitude and urgency of the job cannot be met by your maintenance personnel!

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Custom Service for Transients and "Non-Skeds" at Sioux City

Lowell Crabb, President. Pilot and veteran airport dealer who brought "good service to Sioux City."

Hangar and service ramp at Airways Service, Inc. . . . Sioux City Municipal Airport, Sergeant Bluff, Iowa. Flight office is at right.

Sioux City's air-conditioned terminal and tower. Airways Service also refuels Ozark and North Central Airlines.

"Airline" refueling is prompt and thorough. Oil check, clean windshields, and "walk-around" are standard.

Top-notch facilities and the "will to serve" have made Airways Service at Sioux City a favorite stop for both private and commercial fliers. The municipal airport offers as much as any pilot could ask for—11,000-foot runways, high intensity lights, ILS, FAA weather, LF localizer, Omni, and a modern terminal with air-conditioned restaurant and lounge. Located just 100 yards from the terminal, Airways Service completes the picture with prompt and efficient 24-hour service—mobile refueling with high performance 80 and 100 octane Phillips *66* Aviation Gasoline . . . licensed A&E overhaul and emergency repair . . . and for overnighters: tie-down, hangar space, and car rentals (including special-rate pilot cars). A Mooney Distributor, Airways Service also does a brisk business in sales, student training, and modest-cost custom air travel.

For outstanding facilities and "custom service," put down at Sioux City Municipal Airport and taxi to Airways' ramp. You won't be disappointed!

• • •

New HD Oils . . . For Longer Engine Life

Never before could an aircraft oil promise so much! With improved additives, new Phillips 66 Aviation HD Oils provide top protection against pre-ignition, plug fouling, ring sticking and valve burning . . . keep engines cleaner for longer life, maximum in-flight reliability, and lower operating costs. Phillips 66 HD Oils meet Continental and Lycoming specifications.

AVIATION DIVISION • PHILLIPS PETROLEUM COMPANY • BARTLESVILLE, OKLAHOMA

PHILLIPS 66

AIR REPORT

SIGNIFICANT NEWS — TRENDS

CESSNA ON THE MOVE: Next year might well be the best commercial year in Cessna's history, Del Roskam, executive vice president, predicted during the 1961 International Sales meeting in Wichita late last month. Roskam also revealed that just under $10 million had been spent on research, engineering and tooling for production of 1962 models. Unveiled for the first time was the second flying prototype of the tandem-twin Skymaster, which now has over 100 hours of flight time. This twin should be in production late next year. It will be powered by a new six-cylinder Continental engine developing 210 hp., designated as the IO-360. Many of the new models, details of which will be withheld until January and February, show important refinements, including larger size cabins. Dealers and distributors took delivery of over 300 airplanes at the mass fly-a-way on the last day of the meeting.

TWO-PLACE TWIN FOR $12,500 is being developed by Champion Aircraft Corp., Osceola, Wisconsin. No details have been released but engines are probably in 90-100-hp. class. Called the "Lancer," the miniature twin has a strut-braced high wing, fixed tricycle gear and tandem seats.

NEW AIRESEARCH MODEL 331 "QUIET GAS TURBINE" powers Republic Aviation's Lark helicopter, an American counterpart of the French Alouette. AiResearch says the new turbine has more power, less weight and less fuel consumption than the Turbomeca turbine in the Alouette and Test Pilot George Reno's comment following the first flight was: "It's the first helicopter I've flown where I could carry on a normal conversation while in flight with the doors off the copter." AiResearch says it is the world's largest producer of small gas turbines.

UMBAUGH AIRCRAFT CORPORATION, whose 2-place, 180-hp. autogyro was FAA certificated last month, says it has acquired the 1,750-acre Bartow Airport Industrial Center in Florida and will mass-produce the autogyro there with 3,000 employees. Initial production will begin within 90 days.

REPUBLIC AVIATION AND CHANCE VOUGHT CORPORATION will jointly develop a new multimission fighter to meet new joint Air

BRANIFF AIRWAYS HAS ORDERED A FLEET OF BAC-111 TWIN-JET AIRLINERS, 6 to be delivered beginning in October, 1964, and 6 more optioned for 1965 delivery. Value of the 12 jets, including spares, is about $35 million. Produced by the British Aircraft Corp., the One-Eleven cruises up to 540 mph., carries 39 coach and 24 first-class passengers and will be operated on Braniff's intermediate city services.

FLIGHT MAGAZINE

NOVEMBER, 1961 VOL. 50, No. 11

THIS MONTH'S COVER shows the new Mooney Mark 21 for 1962. It features a 1,050-lb. useful load for full tanks of 48 gals. of fuel and 4 people. With 180-hp. Lycoming engine, the Mark 21 cruises 180 mph. For details on new refinements, see page 24.

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GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; E. H. PICKERING, Air Transport Editor; FRED N. STONES, JR., Business Manager; LOUISE ROBERTSON, Circulation; P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas — Telephone TAylor 3-6191.

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"Build every engine as if you're going to fly it yourself..."

A behind-scenes report on **LYCOMING** *. . . one of the great names in aviation history*

Examining cutaway of Champion's new *Foul-Resistant* spark plug—Herb Fisher and Floyd J. Bird, Vice President-General Manager, Lycoming division of Avco.

by HERB FISHER

international aviation authority, veteran test pilot, author

"Custom-built." "Precision-balanced." "Individually handmade."

These are not static words with the Lycoming division of Avco Corporation. These are the dynamics of Lycoming engine production. And every man who's ever flown behind a Lycoming engine can appreciate the worth of these words . . .

I doubt if there are very many people connected with aviation who *haven't* been behind a Lycoming engine. Two out of every three twin-engine utility aircraft produced in the United States today are powered by Lycomings. Over half the entire light utility fleet is powered by Lycomings. More than 75 *different* models of aircraft and helicopters are powered by Lycomings. They operate in every corner of the globe—under every operational extreme known. As a helicopter engine manufacturer, Lycoming is by far the world's largest.

Lycoming began in 1908 in Williamsport, Pa., and soon was producing engines for virtually all the famous automobile and truck manufacturers of the day. Thousands of 4-cylinder Lycomings saw duty in World War I. (Lycoming also made fragmentation bombs and gas shells.) In 1924, Lycoming introduced America's first "straight-8." It became standard equipment for the Auburn. Lycoming made 57 types of motors in the '20s—for all makes of autos. Marine engines followed.

In 1928, Lycoming turned to aviation and produced its still-famous R-680 9-cylinder, 215-hp radial engine—powerplant for civil, military and first scheduled airlines aircraft. Production of this engine ran 20 years! A long line of more advanced engines followed . . . and Lycoming achieved aviation immortality with many historic "firsts." Thousands of Lycoming aircraft and tank engines powered Allied troops in

R. T. Vandergrift, Lycoming Service Manager (far right), takes Fisher through Lycoming's Engine Service Center at Williamsport Airport. From here, experimental engines are flight-tested and customers' engines are serviced (along with those of Lycoming's own fleet—Piper, Beech and Aero-Commander aircraft).

Lycoming engine undergoes grueling 150-hour heavy-load dynamometer test. Here, Champion spark plugs are evaluated with other brands under torturous conditions. L/R—Fisher; C. H. Wiegman, Vice Pres.-Engineering; Tom Allegretti, Champion Representative; C. H. Buddenbaum, Vice Pres.-Manufacturing; Kenneth Burns, Test Cell Operator.

World War II. Today they power record breakers like Max Conrad and Jerrie Cobb to aviation's Hall of Fame.

In this past year, Lycoming has introduced a complete line of fuel-injection engines. And, even more recently, the turbo-supercharger engine. (First production model has been delivered to Bell Helicopter.) At this writing, Lycoming's crack engineers are in advanced development of a revolutionary 8-cylinder engine.

A half-century of recognition for superb engineering and high-precision production *quality* has made Lycoming a natural for missile work, too: Prime contract (Avco) for Titan and Minuteman re-entry vehicle design/development. Nose cones for the Nike-Hercules. Diffusers for Talos. Production of rocket chambers for both Polaris and Minuteman.

Behind every Lycoming engine is an admonition for self-discipline that the people at Lycoming take very seriously: "Build every engine as if you're going to fly it yourself." It's this self-discipline—backed by a rigid system of quality controls—that puts the guts into Lycoming's program of custom-built, precision-balanced engines.

A quartet of hard-core realists—Floyd J. Bird, Vice President and General Manager; C. H. Wiegman, Vice President-Engineering; C. H. Buddenbaum, Vice President-Manufacturing; and John M. Ferris, Vice President-Sales—took me through the Lycoming plant at Williamsport. Here, some 2,000 people manufacture 4- and 6-cylinder utility aircraft engines. (Jet turbine engines and missile components are manufactured at the company's Stratford, Conn., plant.)

Production at Williamsport starts with milling casting. Eighteen different engine models (or 50 types) take shape in *straight-line assembly*—one integrated production line, unique in this business. Top technicians "hand pamper" components and engines with high-precision machinery at individual "stations" along the integrated straight-line. The best in materials and individual craftsmanship goes into each engine—right down to the chrome-plating of cylinders, another unique feature. A rigid system of controls in production, inspection and testing enables the company to guarantee perfection of each customized engine leaving its plant.

Engines are periodically "torture-tested." Dynamometers load them to capacity and tax their components to the utmost—simulating flying conditions more grueling than a pilot will ever encounter. Performance of components is evaluated and findings of the 150-hour qualification tests are reviewed with the FAA.

In these test cells, Lycoming "weeds the men from the boys" in the way of engine components. It is here that close attention is given one of the most vital of all engine components—the *spark plug*, heart and life beat of an engine. Here Champion spark plugs are evaluated with other brands.

After Champion Engineering developed the new *Foul-Resistant* spark plug, for example, Lycoming put them to the dynamometer torture-test for competitive evaluation.

Results *confirmed* the foul-free performance and long-life dependability of the new *Foul-Resistant* plugs, and Lycoming placed large orders for them. (Five thousand Champion REM40E's came in while I was visiting the plant.)

This, then, is Lycoming—custom-builder of aircraft engines of the highest quality. As a long-time test pilot, I have a deep personal appreciation of the engineering and precision craftsmanship that goes into every single Lycoming engine.

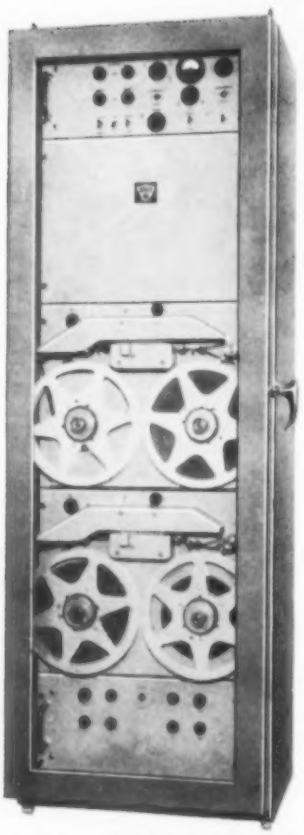
CHAMPION SPARK PLUG COMPANY • TOLEDO 1, OHIO

Above: Wiegman, Fisher and Allegretti inspect engines in unique "Straight-line" assembly. At left: They examine finished engine headed for dynamometer test.

First station on engine buildup: *Every* 6-cylinder Lycoming engine begins here with this one master craftsman—Paul Horner. He averages one an hour.

5 SQUARE FEET ARE ENOUGH TO RECORD ON

15 TRACKS DURING 48 HOURS



ACEC GT-machines record radiotelephone traffic control communications...
...6 channels on 1/4 in. (6,25 mm) tape
...15 channels on 5/8 in. (16 mm) tape...

TECHNICAL DATA

- Reduced dimensions - Depth : 23 in. (54 cm) - Width : 33 in. (83 cm) with 14 in. spools, 25 in. (65 cm) with 10 in. spools - Height : 74 in. (188 cm).
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- Alarm device on each amplifier unit with automatic warning in case of any trouble.
- Alarm device and automatic change-over switching in case of trouble either in the mechanism or in the tape running.
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Force-Navy requirements. . . . **NEW SPEED MARK OF 3,920 MPH.** was attained on Oct. 17 by the North American X-15 rocket research aircraft, piloted by NASA Pilot Joe Walker. He reached an altitude of 110,000 ft. and temperature of the wing flaps reached 1,100 degrees F.

BELL HELICOPTER COMPANY has sold four Model 47G-3B helicopters to the Colombian Air Force.

GENERAL AVIATION LEADS IN REPORTING NEAR-MISSES according to confidential reports received so far by Project SCAN. The SCAN study, begun in July by the Flight Safety Foundation to reduce the hazard of mid-air collision, shows 43% return from private and business pilots to date, with the remaining 57% divided between military and air carrier. SCAN workers note a significant number of reported incidents took place in level flight near VOR stations between 7,000 and 9,000 ft. In the first weeks of SCAN's operation, some 295,000 civil airmen were sent near-collision report forms.

BRITTAIN AUTOPILOT IS NOW FAA APPROVED FOR THE CESSNA 310 according to the unit's manufacturers, Brittain Industries, Inc., of Hawthorne, Calif. The pneumatic-powered Brittain is the first two-axis system to receive FAA approval for the 310, and is the only unit in the low price range approved for twin-engine aircraft with continuous single engine operation. Brittain points out that the single-engine owner may remove and re-install the unit in a twin engine craft he might buy at a later date.

PIPER COLT WILL BE STANDARD FOR ALL SWEDISH AERO CLUBS following a week-long trial at Vasteras Airport in central Sweden. After the government-sponsored Royal Swedish Aero Club's decision to standardize and the subsequent trial, 30 Colts were ordered from the Jonas Aircraft Co., New York City, Piper export distributor, through Nyge Aero, its dealer for Sweden.

REMMERT-WERNER WILL MANAGE THE NEW CLEVELAND LAKEFRONT AIRPORT following their selection by the City of Cleveland. $500,000 is being spent on serv-

Airmen's Calendar

Nov. 14—Symposium On Electronic Systems Reliability, Institute of Radio Engineers, Kansas City, Mo.

Nov. 28-30—38th Meeting, ADMA, Jung Hotel, New Orleans, La.

Dec. 5—National Air Taxi Conference, Eleventh Annual Meeting, Statler Hilton Hotel, Washington, D. C.

Dec. 5-7—Annual Convention, National Aviation Trades Assn., Statler-Hilton Hotel, Washington, D. C.

Dec. 18—25th Wright Brothers Lecture, Smithsonian Institute, Washington, D. C.

Jan. 21-24—Helicopter Association of America's Annual Meeting of Commercial Helicopter Operators in U. S. and Canada, Marriott Motor Hotel, Dallas.

Goin' & Growin':

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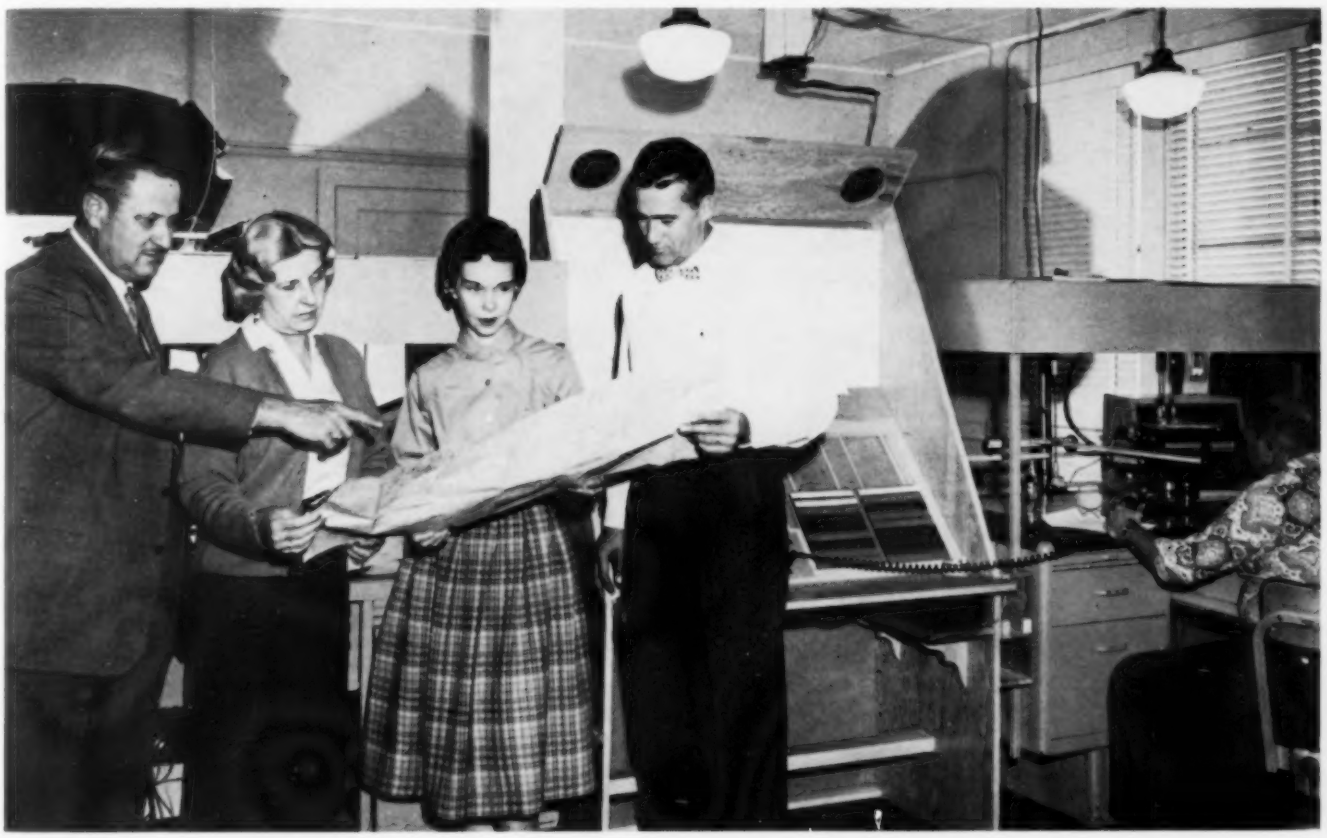

Newest citizens of America's foremost business aviation service community: Left to right, Flight Proficiency Pres., C. D. (Tex) Barry; Secy.-Treas., Mrs. Barry; Secy. Meredith Alexander; Chief Pilot Jeff Graves, and (seated) Link Instructor Page Martin.

A major addition to dynamic, young Service City U.S.A. occurs in November when Flight Proficiency Service, Inc., moves into custom-tailored quarters at the very heart of business flying's No. 1 crossroads. Thus, professional air crew refresher training (including automatic Links) logically rounds out an existing array of specialized One Stop services unequalled within the industry.

Service City salutes and welcomes Flight Proficiency Service!

This is Progress. This is...

SERVICE CITY, U.S.A.

SERVICE CITY *Gail:*
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At Southwest Airmotive, Love Field, Dallas,

- ★ AERO INSTRUMENT SERVICE-SALES, INC.
- ★ ASSOCIATED RADIO SERVICE CO.
- ★ EXECUTIVE AIRCRAFT SERVICE, INC.
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COMPLETE AUTOMATIC CONTROL FROM TAKE-OFF TO TOUCH-DOWN:

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ice facilities, which are to include a 27,000 sq. ft. hangar, shops, offices, parking facilities, and fuel installations. Services to be offered will include charter, 24-hour refueling, all grades of fuel, major repairs, maintenance and conversions, business aircraft sales and leases, and contract maintenance.

EASIER FINANCING ON CESSNA AIRCRAFT is now available from National Aero Finance, a wholly-owned subsidiary of Cessna Aircraft Company. Under the new plan, 4-year financing may be obtained on single-engine Cessnas, including the Skyhook helicopter, and contracts for the twin-engine Models 310 and Skynight may be extended up to five years. Five-year insurance may also be bought with the five-year financing.

A LOW-COST GROUND SPEED INDICATOR FOR LIGHT AIRCRAFT is under development by Hazeltine Technical Development Center under FAA contract. The instrument will provide true ground speed for small aircraft, in a manner similar to that of Hazeltine's present commercial version.

WILEY POST IS NEW NAME FOR TULAKES AIRPORT at Oklahoma City. The city's major airport is named after the immortal Oklahoma humorist Will Rogers.

FIRST NAVION RANGEMASTER DEMONSTRATORS are in the hands of newly-appointed Navion Aircraft Company distributors. Distributors of the five-passenger airplanes are Western Navion, Long Beach, Calif.; Southeast Airmotive, Douglas Municipal Airport, Charlotte, North Carolina; Southern Ohio Aviation, in Ohio; Executive Aircraft Corporation, Wier-Cook Field, Indianapolis, Ind.; and Mid-South Air Sales, Municipal Airport, Murfreesboro, Tenn. Foreign distributors receiving the Navion are Esyablissements Tranchant in Paris; Bremo-Navion, Milan, Italy, and Aero Service San Justo in Buenos Aires.

QUEEN CITY FLYING SERVICE has been bought by Executaire, Inc., exclusive Cincinnati Beech dealer based at Lunken Airport.

A NEW REBAT R33 AIRCRAFT BATTERY has been announced by the Aero/Space Division of The Electric Autolite Company, Toledo, Ohio. Built for longer life and higher performance than present R33's, the new version has 78 plates and increased capacity ratings to 35 ampere hours at the five hour rate. The new unit also features a permanently attached lifter and carrying handle made of lightweight woven plastic.

AIR-TEL WILL CATER TO PRIVATE AIRPLANE TRAVELERS who land at Bowman Field, Louisville, Kentucky, following completion of the proposed $1 million structure. Aircraft Executive Service, the builder, is including in its layout plans overnight air-tel rooms, curb service food, glass enclosed restaurant, patio, and automobile service-station-type attention and maintenance for incoming lightplanes. The complex, which faces Big Springs Country Club, will fill a 12-acre site at Bowman Field.

NEWLY ELECTED NATIONAL AERONAUTIC ASSOCIATION OFFICERS are: President — Martin M. Decker, president of the Decker Corp. of Bala Cynwyd; chairman of the board — Jacqueline Cochran, world famous aviatrix and international record holder; secretary — Arlene Davis (re-elected); treasurer — Edward C. Sweeney (re-elected); general counsel — William P. MacCracken, Jr.

A NEW AIRPORT FOR ALABAMA is the Bibb County Airport at Centreville. A joint project of Bibb County and the Alabama Department of Aeronautics, the new airport has a paved runway, 3,170 ft. long and 80 ft. wide. This and other recent Alabama air facilities, says the Alabama Department of Aeronautics, have been made possible by the state's aviation gas tax.

BEECH SALES FOR FISCAL 1961 exceeded $70 million, down from $98 million for fiscal 1960. The Beech board of directors declared a quarterly dividend of 15c per share plus a 2% stock dividend.

CESSNA SALES FOR FISCAL 1961 exceeded $87 million, down from $103 million for fiscal 1960. A quarterly dividend of 25 cents per share was authorized.

THE NATIONAL PILOTS ASSOCIATION at their 1961 annual meeting last month in Tulsa re-elected Dr. Wm. Requarth, a Decatur, Illinois, surgeon as president. Vernon Pond, Jr., of Ohio and L. S. White, Jr., of Oregon, were elected vice presidents. New secretary is Croom Beatty of Illinois and treasurer is James F. Nields of Massachusetts. New directors include Lackland Bloom of St. Louis, George Hughes of New York, Frederick B. Lee of Washington, D. C., and Herman Teetor of Hagerstown, Maryland. . . . **N. O. BRANTLY**, who developed the Brantly helicopter, received NPA's "Pilot of the Year Award" at the annual banquet. He was cited for his pioneering work in both low-cost rotary wing aircraft and instrument flying.

EDWARD (BOOGER RED) VENCILL, one of the truly legendary pilots of Southwestern aviation, died in a plane crash last month near Lake City, Arkansas, while spreading chemical fertilizer in a crop duster. He was 49. It is believed he lost power at low altitude with a fully loaded hopper, hit rough ground, turned over and caught fire. Booger Red grew up during the barnstorming days on Dallas' Love Field. He was recognized by fellow pilots as a "natural," having had very little formal training. After years of outlaw defiance of civil air regulations, Booger settled down to full compliance with the law and professional crop dusting. His most famous quote: "I've had more crack-up time than most pilots have straight and level."

SALUTE!

To Our Teammates on the Supply Line

EDDIE FISHER FLYING SERVICE, Fairfax Airport, Kansas City, Kansas

SALUTE! When you know Eddie Fisher (as do hundreds of airmen from every corner of the country), you know immediately why the Flying Service that bears his name is an ever-growing success. This progressive, and aggressive, veteran has been a pilot and fixed base operator since 1934. His operations have centered on Fairfax Airport since WW II and now serve as home base for 48 airplanes. Principal services — strongly supported by supplies from Southwest Airmotive — include major repairs to airframes and engines; the pumping of 80/87, 91/100, and 115/145 octane gasoline, and also jet fuel for the latest in business aircraft.

ERHART FLYING SERVICE, INC., Municipal Airport, Lawrence, Kansas

SALUTE! Located 40 miles from Kansas City in the humming university community of Lawrence, Erhart features FAA-approved engine and airframe service and a flight school including, naturally enough, ROTC students from the campus of old KU. Visiting and locally-based aircraft taxiing in from the hard-surfaced runways find lots of hospitality, along with 80/87 and 100/130 octane fuel. They also find a complete line of Cessna airplanes available from this good customer of Southwest Airmotive Company. Delbert Erhart, and his associates, began this top-flight service in 1951.

EXECUTIVE FLIGHT, INC., Municipal Airport, Tulsa, Oklahoma

SALUTE! Big news at Executive Flight (formerly Yingling Aircraft) is its outstanding flight school. Students benefit from modern classrooms, highly-trained instructors, new Cessnas, electronic Links, and much personal attention. Cessna sales and service, maintenance and supplies (many from Southwest Airmotive) complete a busy scene here. Pictured, left to right, are: Don Miller, charter service; Bill Miller, service mgr.; Bill Miller, Jr., parts mgr.; Bill Fonderon, radio; Dick Schultz, flight instructor; John Gordy, district sales mgr.; Marge Cooper, office mgr.; Frank Cosby, aircraft sales, and H. L. (Hamp) Caron, owner.

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EDITORIALS

All Hail The Mighty Salesman

THIS is the time of year the major utility plane manufacturers hold their annual sales meetings. For a couple of days the people who should be considered the most vital element in general aviation come together to acquire the latest new product information and learn about marketing plans for the coming year. They patiently sit and listen to canned sales talk, finance plans and all the other subjects designed to spur them on to greater sales effort. Then they climb into a new model and fly away home where they go about their difficult and highly specialized business of peddling airplanes.

One of the strangest enigmas in our aviation complex is the fact that Mr. Salesman isn't "Mr. Big" throughout the year. Without him we wouldn't even have an industry. Nothing happens until he sells somebody an airplane. The manufacturers' wheels don't turn, the airports aren't occupied, the shops aren't patronized, the gas pumps are stilled and the thousands of Federal aviation employees are idle until the airplane salesman does his job.

He has to pay all the salaries and overhead and he originates whatever profit derives from the utility airplane business. But the spotlight of public attention month in and month out is on nearly every other sector of the business. You would think from the press and from conversation that the Federal government is the king pin in aviation. Conversely, it's the retail salesman who has to deliver a new airplane before the wheels start turning. While there are thousands of essential people in commercial aviation who do necessary and productive jobs, it's the airplane salesman who keeps them in business or on the payroll.

In all the rush and bustle and in the plethora of news about products and less important people, we sometimes are prone to forget that the salesman is the propellant that thrusts us through the air. We ignore the tremendous investment in flying time and selling experience that are such necessary ingredients of a competent and productive salesman in a field as highly specialized as utility aircraft. Nor do we give much thought to the fact that the airplane salesman today has to be a jack of many trades — a transportation expert, an accomplished pilot, a social animal and as personable as a successful politician.

Today there are about 1,000 retail outlets in general aviation ranging all the way from million-dollar distributor establishments down to one-man dealerships on small-town airports. It's high time everybody in the business gave recognition not only to the absolutely essential role of the airplane salesman but also to the necessity of building his prestige up to the level of his actual position as a real professional in the field of air transportation.

The Delta Formula

WHILE many airlines are complaining of red ink, it is encouraging to note that Delta Air Lines is making money. The experts, of course, can go into all the technical factors and give professional explanations why but we believe a lot revolves around leadership.

Delta Air Lines started back in 1925 as a Louisiana crop dusting outfit when a district agricultural agent and ex-professor by the name of C. E. Woolman helped organize Huff-Daland Dusters to combat the most serious boll weevil infestation in the history of the South. Woolman, who learned to fly in Jennies right after the first World War, still heads Delta Air Lines, which emerged from the old dusting company. His operations in South America laid the foundation for Panagra, which pre-dates our own major "chosen instrument" foreign operator, Pan American Airways.

Last month Delta extended its services to the West Coast, thereby becoming the fifth transcontinental air carrier. Competition is mighty tough in this field. The strong and seasoned

leadership of C. E. Woolman, coupled with the old-fashioned employee loyalty that characterized all the airlines in years gone by, will in our humble opinion spell even greater success for this company in the future. It couldn't happen to nicer folks.

Upgrading Aviation Objectives

THE encroachment of Big Government on nearly every facet of American life is having a detrimental effect on many U. S. industries and our domestic aviation industry is certainly no exception.

Too often Mr. U. S. Businessman looks to the government for leadership instead of either supplying that leadership himself or joining with others attempting to lead rather than to follow.

It is all well and good for the Government of the United States to call up various aviation leaders under the direction of the Federal Aviation Agency to set forth our national aviation goals, as illustrated a few weeks ago with the release of the Project Horizon Report. The big danger lies in the fact that the report does not reflect even the remotest sort of majority opinion within the aviation industry. Yet many people in all walks of life, both in and out of government, will consider the report as "gospel." Unfortunately, it is just one more official report on the state of the union regarding our aviation business community and probably will be filed for occasional future reference, ultimately to be forgotten with the rest.

About the nicest thing you can say about such undertakings is that they are provocative, sometimes stimulating healthy argument. As for solving many of the problems of U. S. domestic aviation, they just don't have the answers.

Ever since the emergence of U. S. civil aviation from the barnstorming era of the late Twenties and early Thirties, we have become used to dealing with Federal agencies and suffering Federal domination in both areas of economic and operational control. The philosophy of Federal control of civil aviation has become so ingrained that we take it for granted. Federal employees involved in aviation agencies now number in the neighborhood of 40,000. Little wonder Project Horizon estimates that the cost of the air traffic control system in the forthcoming fiscal year will be $479 million! We are afraid to ask if this figure includes the millions going into experimental research and development, which probably are additional.

Somewhere there must be a breaking point. There are not enough active airplanes in the sky nor enough airline passengers to justify the kind of money now required to maintain the burdensome Federal aviation bureaucracy. What's needed is a genius to figure out how much of the expense can be charged to national defense and the national interest. As we move more and more into the missile age, the cost, whatever it might be from a military standpoint, would be expected to diminish.

Aside from the point that municipalities run to Washington for hand-outs for such projects as jet airports, and the mounting costs of subsidy to various sorts of air transport have no end in sight with more and more being requested; the real burden to the American taxpayer for aviation facilities and services stems from the day-to-day operations of a huge Federal aviation complex which has every indication of being over-staffed. There is not one chance in a million of changing this situation by waiting for the government to initiate some kind of efficiency study or seek ways and means to reduce, rather than expand, its operations. It is a classic example of Parkinson's Law at work. The pity of the situation is that the costs of expanding air services and the costs of Federal participation in the airport program, representing peanuts compared to over-all costs, catch all the hell while the monster eats up the main meal. Recent Congressional hearings on expanding our helicopter air services are a case in point.

It will ever be thus until industry leadership takes the lead, upgrades its objectives and turns these objectives into national policies with its own efforts. So long as we wait for the government to show all the initiative, we deserve exactly what we get — a monstrous bureaucracy which is bound someday to crash and bring all our recent progress down with it.

Lest we be misunderstood, we reiterate our approval of official government studies, including the most recent efforts to blueprint our national aviation goals. But until all elements of U. S. civil aviation decide to take a little time off from their own selfish pursuits and write their own Civil Aviation Manifesto, backed up by a realistic plan of action, we will get exactly nowhere. At the moment it appears we are apt to continue to develop an even greater dictatorial and enormously expensive behemoth far beyond the state of the art and beyond the patience of the American taxpayer, whose plaintive cries for relief are now bouncing off the walls of the U. S. Senate and House of Representatives.

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See your Piper dealer or write for new Apache H brochure, Piper Aircraft Corp., Lock Haven, Pa.

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Add these to the Mark 21's proven supremacy in high speed performance and economy and you'll discover that the all-metal Mooney Mark 21 for '62 has **all** of the qualities which herald the out-flyingest, out-sellingest plane on the market.

Never has a new airplane been such a rewarding investment: in pleasure, comfort and safety. The Mark 21 will pamper your pride and your pocketbook. See your Mooney dealer today or write for an illustrated brochure on the "world's most efficient airplane."

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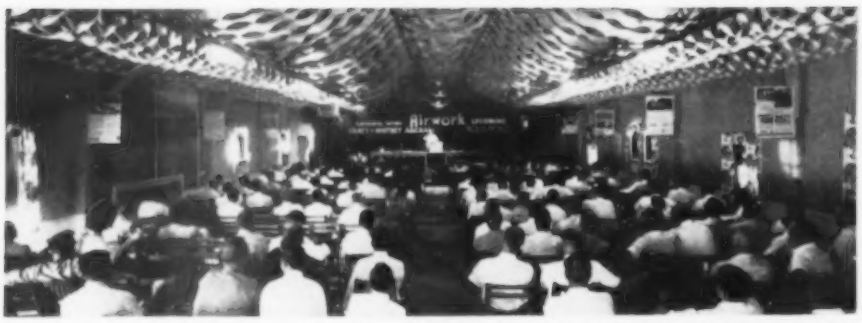

Facts on engine operations and maintenance predominated the forum discussions led by experts.

Airwork's Best Symposium

QUALITY was the keynote of Airwork Corporation's 1961 Operations and Maintenance Symposium in late September at the homestand in New Jersey. It was quality all the way — an audience made up largely of executive pilots who really utilize airplanes, papers of quality delivered by quality speakers, plus a display of quality products and services.

Perhaps the most impressive aspect of the two-day affair was the latest information on engines dispensed by the engine people. Too often the emphasis is on aircraft design and gadgetry with the progress being made in engines more or less brushed aside. It was the other way around at the Symposium.

Users of Continental, Lycoming, Rolls-Royce and P&W engines profited from the meaty discussions of factors that influence time between overhauls, tips on preventive maintenance and proper operating procedures for the latest turbine power packages and for the new fuel injection engines.

A look into the future on what the new light turbine engines hold for business airplanes was provided by a panel consisting of Tony Clark of Canadian Pratt & Whitney, Dr. Fritz Haber of Lycoming and Tom Bowling of Continental, with Leighton Collins as moderator.

Al Winick of the Federal Aviation Agency's research and development services reported on that agency's studies in cockpit standardization and the field of exotic electronic equipment. Bob Pruitt of Collins Radio told how advanced electronic equipment will speed IFR handling in the new ATC environment, with emphasis on the importance of DME and the transponder.

Goodrich spokesmen gave detailed reports on brake and de-icer systems for business airplanes. Standby rocket power was discussed by Gil DeVore, Ray McGreever, Joe Betty and Ed Rice. Rice, of Aerojet General, provided a demonstration firing of Jato on a Beech Super 18.

AC Spark Plugger Al Gosset described the "Skyphone" which now makes it possible for the executive to make telephone calls from his cabin in flight. Joe Chase of Flight Safety Foundation propounded a new concept of preventive maintenance, while the latest developments in fuels and oils and operating hints were outlined by F. H. Stedman of Humble, Dr. Hugh Darby of Alcar Instruments, Dick Foster of Shell and Frank Tobin of Texaco.

While the annual Airwork Symposium does an excellent industry relations job for Airwork Corporation, the avoidance of commercialism at the

(Continued on page 55)

Latest developments were viewed in displays provided by engine manufacturers and other exhibitors.

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B.F.Goodrich has provided special training to 90 installation and service centers all over the U. S. Your BFG Aviation Distributor can recommend the most convenient center for your service needs.

Equip your twin now with BFG lightweight De-Icers. You can add a priceless margin of safety, and increase the utility of your aircraft in winter months by installing BFG De-Icers. This is the first simple pneumatic system, for wing and tail leading edges, specifically designed and priced for light twin-engine aircraft. The system is entirely mechanical, and adds only from 48 to 69 pounds to the weight of the plane (depending on aircraft.) Half of this weight can be easily removed during the summer. A compressed air sphere stores energy for approximately six hours of de-icing. BFG lightweight pneumatic De-Icers are now FAA-approved for Beech Travel Air and Twin Bonanza, Cessna 310, Piper Apache and Aztec, Aero Commander. Installation can be made in the field at any one of 90 factory-trained service centers. For BFG Aviation Distributors—see opposite page.

De-Icing systems B.F.Goodrich

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Division of UNITED AIRCRAFT CORPORATION, Stratford, Connecticut

How much do you know about detonation and preignition?

Once either of these headaches attacks your engine, the least you can expect is a dead cylinder.

DETONATION: To get an idea of what happens when detonation goes to work in the combustion chamber, hit a piston with a heavy hammer a few times—hard—right on the crown! The resulting mashed-in effect and sharp-edged hole is a reasonable facsimile of detonation's destructive forces.

There's more. When things have gone this far, the engine could catch fire, or "freeze," or everything could happen at once. You can draw your own conclusion as to the next step.

There are warning signs, though: loss of rpm on take-off, extremely high head temperature, or a visible, white "sparkler" type exhaust. It still may not be too late to taxi back to the parking area and take corrective action. Undoubtedly, this will mean stopping the use of fuels having a lower octane rating than engine specs call for. Once your octane is correct, make sure your mixture is, too, for maximum power and performance.

PREIGNITION: This occurs when your fuel/air mixture is ignited while the piston is on the compression upstroke. It's usually caused by a glowing particle of combustion-chamber residue or an overheated part. Since preignition is also accompanied by high temperatures, it can actually melt through a piston and start a fire in the crankcase.

The simplest way to avoid preignition is good spark plug maintenance, examination of combustion chamber for deposits.

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New Mooney

TEN significant new features and refinements have been announced for the 1962 version of the all-metal, 4-place, 180-hp. and 180-mph. Mooney Mark 21 — along with plans to double production during the coming year. The efficient Mooney outsold everything in its class this year, racking up 228 deliveries worth more than $4 million. Hal Rachal, president, expects 512 deliveries worth more than $8 million during 1962 in view of the Mark 21's growing popularity and projected doubling of Mooney's distributor-dealer outlets.

Price of the new version is $16,450, up $500.

Mark 21 improvements include the following:

More payload in a new 1,050-lb. useful load, up 90 lbs., with a new gross weight of 2,575 lbs. and empty weight of 1,525 lbs.

New infinitely-variable-positioned flap system, hydraulically hand-pump operated and with 33-degree travel for greater flap effectiveness.

New Hanlon-Wilson manifold exhaust cross-over system with single outlet which smooths out 4-cylinder exhaust impulses for a quieter cabin.

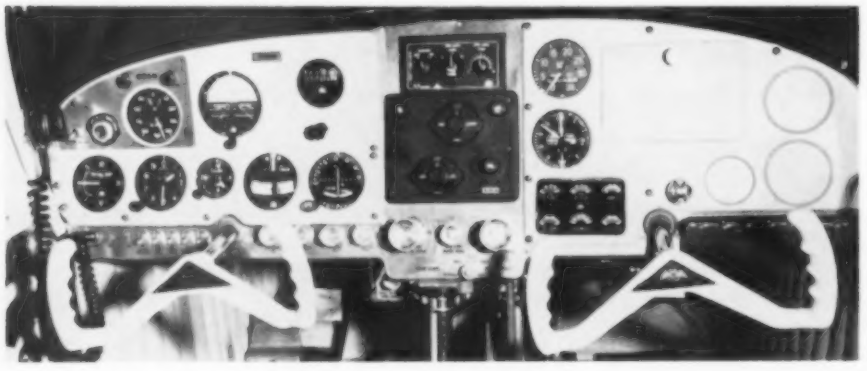
New cabin heat system with 50% greater capacity.

New and completely re-designed instrument panel with flight instruments in "T" formation, using new pictorial horizon, new engine-instrument cluster, new-type controls for throttle and propeller, new switches and circuit breakers and new radio panel arrangement.

New ARC electronic autopilot especially customized for Mooney by Aircraft Radio Corporation.

New trim controls for easy trimming under all condi-

Take-off picture shows Mark 21's manually-retracted gear coming up. New instrument panel (below) provides as standard equipment a T-formation grouping including pictorial horizon. Note new engine cluster and new control knobs.



1962 Mooney Mark 21

Factory Data

Powered by 4-cyl. Lyc. O-360-A1D, 180 hp. at 2,700 rpm.

Price	$16,450
No. Seats	4
Gross Wt., lbs.	2,575
Empty Wt., lbs.	1,525
Useful Load, lbs.	1,050
Useful Pct. of Gr. Wt., %	40.7
Useful Fuel Cap., gals.	48
Stall Spds., power on-off, mph.	54-57
Cr. Spd., 75% hp.-7,500 ft., mph.	180
Cr. Cpd., 67% hp.-7,500 ft., mph.	172
Cr. Spd., 55% hp.-10,000 ft., mph.	164
Range, no reserve, miles	915
Rate of Climb, fpm.	1,000
Service Ceiling, ft.	20,000
Take-off Distance, ft.	675
Landing Distance, ft.	550
Wing Area, sq. ft	167
Wing Loading, lbs. sq. ft.	15.4
Power Loading, lbs. hp.	14.3
Bagg. Capacity, lbs.	120
Span, ft.	35
Length, ft.-ins.	23-2
Height, ft.-ins.	8-4.5

NOTE: Performance is for gross weight at sea level unless noted.

1962 Mark 21 Hefts Bigger Load Has Better Flaps And Quieter Exhaust

tions and with new trim indicator located on nosewheel cover within easy view.

New rudder pedals have been re-located for ease of use.

New constant-speed controllable-pitch Hartzell HC-C2YK/7666-2 propeller, tailored to the Mark 21's design requirements.

New interior with completely-new form-fitting rear seat and redesigned front seats using foam rubber for greater comfort.

The Mark 21 is powered by a 4-cylinder Lycoming O-360-A1D engine rated at 180 hp. at 2,700 rpm. Performance remains the same for speed, with 180-mph. cruise at 75% power (135 hp. at 2,400 rpm.) at 7,500 ft., 172 mph. at 67% power (121 hp. at 2,300 rpm.) at 7,500 ft., and 164 mph. at 55% power (99 hp. at 2,200 rpm.) at 10,000 ft.

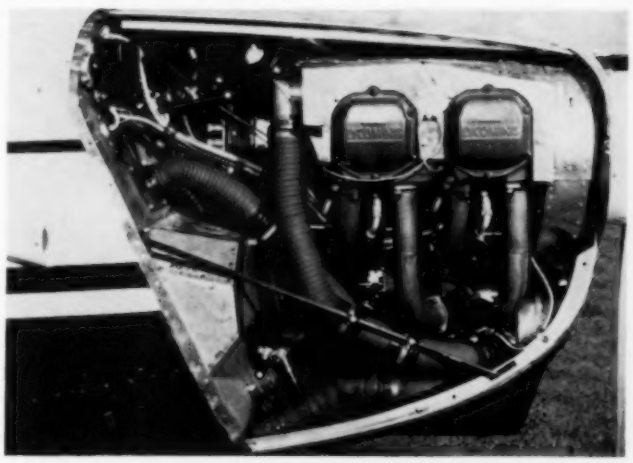
The increase in useful load to 1,050 lbs. gives the Mark 21 a useful percentage of gross weight of 40.7%. This permits loading of 4 people with full tanks, which have a useful capacity of 48 gals.

Flap travel of 33 degrees compares with only 22 degrees in the 1961 model, the increase amounting to 50% more flap extension for improved control at low speed and better landing characteristics. Actually, the increase in flap effectiveness is much greater than indicated, because only about half of the original flap travel was really effective.

The new flaps are actuated by cycling the flap handle. Four and one-half cycles of the flap handle extends the flap to a full 33 degrees. A hydraulic release button is located just below the propeller control on the instrument panel. When this button is pulled out, the hydraulic pressure is released and spring tension retracts the flaps slowly and smoothly. A restrictor valve is located in the hydraulic system to preclude too rapid retraction of the flaps in flight.

While ARC's new electronic autopilot will be optional at $995, all 1962 Mark 21's will have as standard equipment the power cable required for the installation. Mooney describes the new ARC unit as being especially rugged. It uses a turn and bank gyro for tumble-free operation

(Continued on page 60)



Quieter cabin has been achieved with use of new manifold exhaust system. New heater system provides more capacity. New cabin interior (below) features contoured seats of foam rubber. More leg room is available. Red and blue interiors go with exterior color scheme of red, blue and gold.

A dorsal fairing has given the Debonair a Baron-like swept tail for 1962.

More Fuel and Low-Priced Autopilot Featured

NEW DEBONAIR

A SWEPT tail resembling that of the Baron Twin distinguishes the new Beechcraft B33 Debonair for 1962, which also has a new and more functional instrument panel and new interior and exterior styling. It is priced at $21,975, which is $225 higher than this year's A33.

New Debonair interior includes more comfortable rear seat (above). Instrument panel (below) groups flight instruments at left and provides plenty of space for radios and other equipment. Note Tact-air autopilot control unit.

Performance remains unchanged for the 4-place Debonair, which is powered by a 225-hp., fuel-injected Continental IO-470-K engine. It cruises at 185 mph. on 75% power at 7,000 ft., 180 mph. on 65% power at 11,000 ft., and 154 mph. on 50% power at 10,000 ft. With 78-gal. optional useful fuel capacity (standard capacity is 50 gals.) in contrast with 68 gals. in the previous model, range is from 940 miles at 185 mph. to 1,135 miles at 154 mph. These range figures include allowance for starting, run-up, taxiing, take-off, climb to altitude and 45-minute reserve at maximum-range speed. Such allowance is quoted for the first time and the range figures thus represent an increase over those previously quoted by Beech.

The Debonair has a hefty 1,225-lb. useful load at a 3,000-lb. gross weight, this being almost 42 per cent of gross and sufficient for four people with full tanks. A newly-styled and more comfortable interior includes new front chair-seats with three-position fore-and-aft adjustment and four-position reclining adjustment for the seat-backs, plus new high-back rear seats of "perfect posture" design. Up front, the microphone is mounted on the center arm-rest.

A new instrument panel groups all instruments in front of the pilot on a removable, shock-mounted panel with custom die-molded glare shield and space for additional instruments and navigation aids. Radio equipment is installed in a removable panel to the right of center. This panel is large enough to accommodate four standard-size radio units.

A new 72-lb. Beechcraft "super utility package" is offered at a factory-installed price of $3,250 and includes Beech "Power Flite Control,"

(Continued on page 54)

Beech Debonair

Factory Data

Price	**$21,975**
No. Seats	**4**
Horsepower (fuel-injection Continental IO-470-K)	**225**
Gross Wt., lbs.	**3,000**
Empty Wt., lbs.	**1,745**
Useful Load, lbs.	**1,255**
Useful Pct. of Gr. Wt., %	**41.8**
Fuel Cap., gals.	**50**
Opt. Fuel Cap., gals.	**78**
Top Speed, mph.	**195**

Cruising Speeds —

Hp.	Alt.	Mph.
75%	7,000	185
65%	11,000	180
50%	10,000	154

Cruising Range —

Mph.	Gals.	Miles
154	78	1,135*
180	78	1,050*
185	78	940*

Stall Speeds, power off, mph. —	
Gear and flaps down	**60**
Gear and flaps up	**71**
Rate of Climb, fpm.	**960**
Service Ceiling, ft.	**18,400**
Wing Area, sq. ft.	**177.6**
Wing Loading, lbs. sq. ft.	**16.9**
Power Loading, lbs. hp.	**13.3**
Span, ft.-ins.	**32-10**
Length, ft.-ins.	**25-6**
Height, ft.-ins.	**8-3**
Cabin Length, ft.-ins.	**6-11**
Cabin Width, ft.-ins.	**3-6**
Cabin Height, ft.-ins.	**4-2**
Baggage Cap., lbs.	**270**

NOTE: Performance is for gross weight at sea level unless noted. *Includes full allowance for fuel used during warm-up, taxi, take-off and climb to altitude with a 45-minute fuel reserve at maximum-range speed.

New Piper Apache H

PIPER Aircraft Corporation has introduced a new "H" model Apache for 1962, holding the old price of $37,990 for the popular small twin, which is powered by two 160-hp. Lycoming engines.

Performance remains unchanged. It includes 171-mph. cruising speed on 75% horsepower at 7,000 ft. Standard fuel capacity is 72 gals. With 108-gal. optional capacity, range is 940 miles on 75% power. Two-engine fuel consumption is 18.8 gals. per hour. At 45% power, range is stretched to more than 1,200 miles.

Provision has been made in the new model for factory installation of more electronic equipment including distance measuring equipment (DME). An AutoFlite version includes two-axis Piper AutoControl pilot or, optionally, the 3-axis Piper AltiMatic autopilot.

Piper Apache H

Factory Data

	Apache H
Price	$37,990
No. Seats	4-5
Total HP. (2 Lyc. O-360B)	320
Gross Wt., lbs.	3,800
Empty Wt., lbs.	2,320
Useful Load, lbs.	1,480
Useful Pct. of Gr. Wt. %	38.9
Std. Fuel Cap., gals.	72
Optional Fuel Cap., total gals.	108
Top Speed, mph.	183
Cr. Spd., 75% hp. at 7,000 ft., mph.	171
Fuel Consumption, 75% hp., gph.	18.8
Cruising Range, 108 gals., 75% hp., mi.	940
Cruising Range, 108 gals., 45% hp., mi.	1,260
Stall Spd., mph.	61
Minimum SE Control Spd., mph.	80
Rate of Climb, fpm.	1,260
SE Rate of Climb, fpm.	180
Service Ceiling, ft.	17,000
SE Absolute Ceiling, ft.	5,500
Take-off Run, ft.	1,190
Landing Roll, ft.	750
Wing Span, ft.	37
Length, ft.	27.1
Height, ft.	9.5
Wing Area, sq. ft.	204
Power Loading, lbs.-hp.	11.9
Wing Loading, lbs.-sq. ft.	18.6
Baggage Cap., lbs.	200
Bag. Compt. Space, cu. ft.	25
Cargo Space (rear seat out), cu. ft.	80

NOTE: Performance is for gross weight at sea level unless noted.

Apache H's new paint styling and re-styled interior are pictured.

Aircraft

The Howard 500 (above) displayed at NBAA is Howard Aero's newest 350-mph. pressurized executive transport with 2,600-mile range. Below is the 4-place Meyers 200, one of many single-engine business planes displayed at the show.

—(FLIGHT MAGAZINE Photos by E. H. Pickering.)

WHILE the emphasis was on the larger and more costly executive-type aircraft at the National Business Aircraft Association's 14th annual meeting and forum late in September in Tulsa, the affair was by all odds the most outstanding general aviation gathering of the year to date.

Not only was there tremendous industry support in the showing of aircraft and all the equipment that makes them tick, but just as important was the well-organized program that dished out plenty of red meat on timely topics of interest to all airmen. As

ftShowcase

New Aircraft and Equipment Featured in Displays At 14th Annual NBAA Convention

Fairchild F-27 prop-jet executive transport was among turbine-powered aircraft dominating the show. Below is W. T. Piper, the manufacturer, who was honored with NBAA's annual award for meritorious service to aviation.

—(FLIGHT MAGAZINE Photos by E. H. Pickering.)

Lockheed JetStar and Sikorsky S-62 turbocopter at NBAA show are pictured at left, framed under prop-jet Allison-Convair. Below is a tricycle Beech 18 conversion shown by Capitol Aviation of Springfield, Ill.

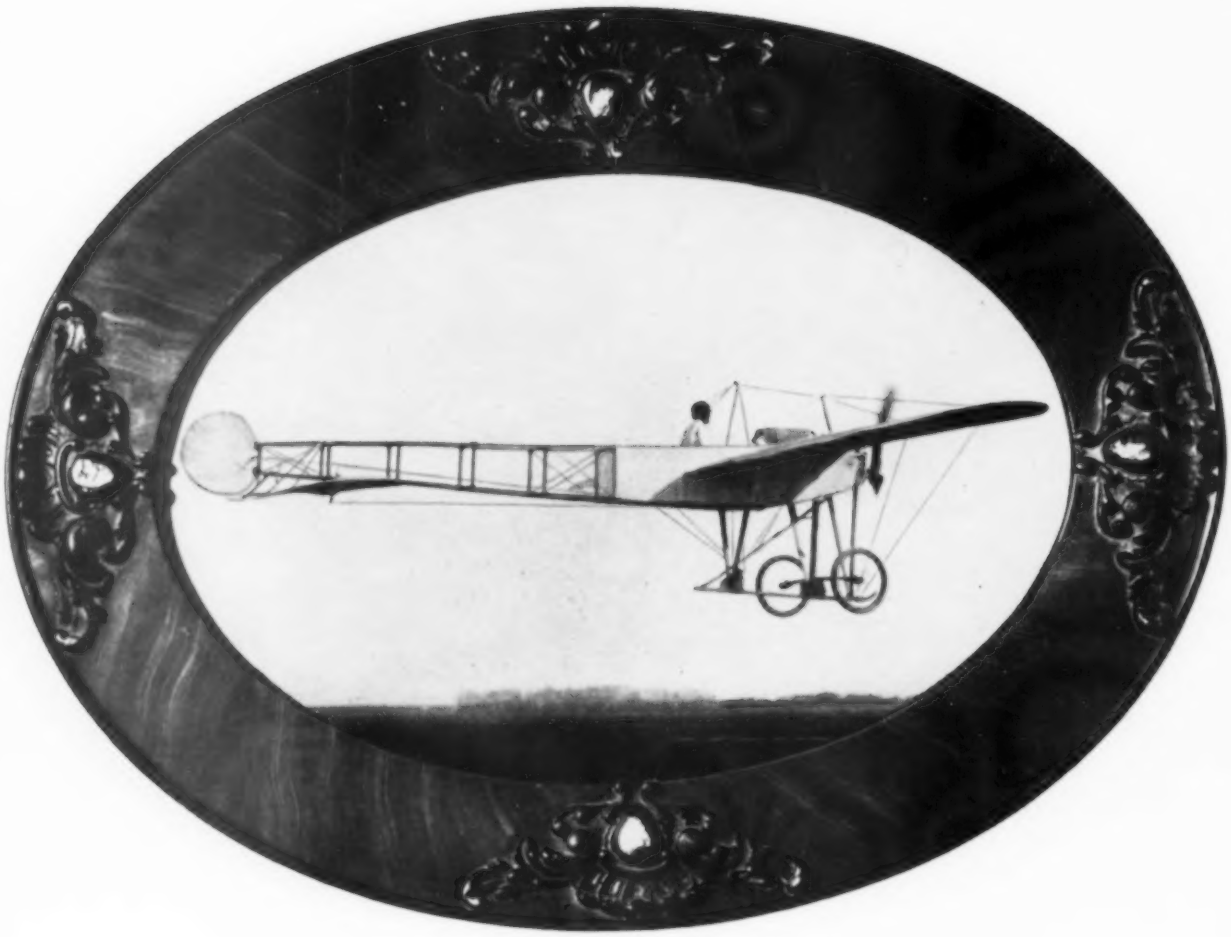
—(FLIGHT MAGAZINE Photos by E. H. Pickering.)

a result nearly everyone in attendance had nothing but praise to NBAA's Bill Lawton and to the Tulsa committee that provided all the arrangements.

All types of corporate aircraft were displayed at Tulsa Municipal Airport for NBAA members — from the little 2-place Brantly helicopter on up to Lockheed's JetStar and including the turbo-prop Grumman Gulfstream, Fairchild F-27, and the turbo-shaft Sikorsky helicopter. It was not only the newly-certificated or yet-to-be-built dreamplane that made the NBAA show outstanding, however — just as important were improvements and equipment for existing aircraft already in use. This was an industry-wide showcase and suppliers of a wide range of equipment were there with sales material and displays.

It was plain, however, that a new corporate aircraft era was being ushered in by final FAA certification of the JetStar, coincidentally with the convention, plus flight demonstrations of the JetStar from the airport's short runway. This 500-mph. speedster had appeared at previous NBAA shows but Lockheed is now making JetStar deliveries, has a production-line humming and is beating the corporate bushes for sales in pressing competition with existing aircraft designs which have been obsoleted by the JetStar's performance. Corporate aircraft users who must keep up with the Joneses in performance were thus brought closer than ever to the time when a decision will have to be made — will they go into turbo-prop designs first, or will they go straight from pistons to pure jets?

(Continued on page 54)



1912

Clyde Cessna flew his Silver Wings at 50 m.p.h. and began 50 years of Cessna progress in business aviation

One winter day in 1910, shivering more from excitement than cold, a slim young mechanic named Clyde Cessna watched a handful of barnstormers push their cloth-and-wire contraptions through daredevil maneuvers. After the air show, convinced that flying had a great future, Cessna hurried home to build his own plane.

On June 9, 1911, after twelve unsuccessful attempts, he got his machine up to an altitude of 100 feet. Then he taught himself to fly and performed at several exhibitions. But still dissatisfied with his plane, he spent the next winter completely rebuilding it. By 1912, he completed the *Silver Wings*, which he regarded as his first truly successful airplane. With it, he amazed crowds with its 50-m.p.h. speed—and began the tradition of constant design advancement which has made the Cessna Aircraft Company the world's leading producer of business aircraft.

Today, Cessna enjoys the reputation of being not only the oldest business plane manufacturer, but also the most successful. The company's modern facilities extend over 1,200 acres at Wichita and it owns three subsidiary companies. It markets its products through more than 400 dealers around the world. And it produces thirteen of the world's most popular aircraft.

NOW FOR 1962

This symbol will identify the greatest single-year advance in business planes: Cessna's new Anniversary Models

To put all 50 years of aviation design experience into a line of airplanes that will remain advanced many years to come—Cessna more than *doubled* the money usually spent for design advancement and retooling. And so successful were the results, Cessna *doubled* the warranty life on its entire Anniversary Fleet. So for 1962, when you buy an aircraft with the *Cessna Anniversary Fleet* symbol, you'll know you're buying the world's most modern aircraft!

Preview the first of Cessna's new models soon at your Cessna dealer's. (While you're there, ask him for the dates all 13 models will be shown.) Call him now for a demonstration flight during the . . .

FIRST PUBLIC SHOWING . . . NOVEMBER 4th AND 5th

CESSNA 13 BUSINESS AIRCRAFT

Clyde V. Cessna in his "Silver Wings," built in 1912 from his first airplane, which he constructed in 1911 with Bleriot fuselage and 60-hp. Eldridge marine engine. Silver Wings had 60-hp. Anzani.

50 Years of Cessna Growth

CESSNA airplanes have been flying for 50 years, the first being hand-built in 1911-12 by Clyde V. Cessna, the Kansas farm-boy mechanic turned exhibition pilot and aircraft builder whose colorful barnstorming career launched the Cessna Aircraft Company in 1928.

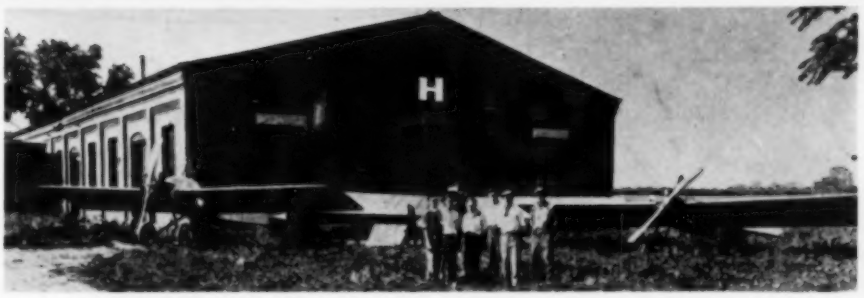
For 1962, Cessna's "50th Anniversary Fleet" commemorates a half century of progress and growth to world prominence. With the largest global network of aircraft sales and service dealers — 300 in the U. S. and 100 abroad — and the most complete line of airplanes on the market, Cessna has become the giant of the lightplane industry and the only manufacturer whose production includes helicopters and jet aircraft as well as piston-powered airplanes for a wide range of commercial and military activities.

Through six colorful stages of aviation history — barnstorming, air racing, Depression dilemma, military preparedness and war production, post-war re-conversion and the 1950-60 decade of competitive sales and marketing — a distinctive flair for promotion and showmanship has become a Cessna trademark, combined with an uncanny ability to make a profit on each and every airplane sale for the last fifteen years or so.

The biggest showman of all in the company's early evolution was Clyde Cessna himself. No kid when the flying bug bit him while watching his first air circus in February, 1911, he abandoned a lucrative auto sales agency future at Enid, Oklahoma, to take to the air at age 31. By May, 1911, he had constructed his first aircraft with a Bleriot monoplane fuselage, his own wing and tail designs and a converted

First airplane built in Wichita was Clyde's 1917 model. It advertised Cessna under one wing and Jones Six auto under the other and was powered by 60-hp. Anzani.

Cessna's 1917 Comet had enclosed cockpit (above) and covered fuselage. At right is 1917 factory scene, showing Clyde Cessna and his 5 helpers.



60-hp. Eldridge marine engine. Cessna taught himself to fly the hard way on the Salt Plains near Jet, Oklahoma, in a series of 12 taxiing accidents and several flight crack-ups, all the while correcting aerodynamics and control deficiencies by the trial and error process, repairing or rebuilding the airplane after each misfortune and nursing a series of minor injuries. By September he was booking aerial demonstrations at $300 each, but four shows in Oklahoma by the end of 1911 were not enough to recover his costs. He moved back to his 40-acre farm near Rago, Kansas, where he had grown up, establishing residence in a barn with his wife and two children living in the loft while he used the ground floor as his shop.

For a 1912 model, Cessna completely rebuilt his airplane, installing an air-cooled, 60 hp. Anzani engine, incorporating a buggy spring in the landing gear as a shock absorber and naming it "Silver Wings." By flying from one location to the next for his aerial demonstrations, unlike other early barnstormers who moved across country on railroad cars, Clyde could book more shows per month. He built an airplane each year, successive models featuring improvements and innovations such as his first windshield, fabric covering for the fuselage and more effective controls (he solved the old Eldridge engine's heating problems and it replaced the Anzani). There was neither time nor inclination to build airplanes for sale — indeed, there was more money in exhibitions than in selling airplanes.

"Cessna in his Monoplane" was his billing for shows and spreading fame for his flying skill brought large crowds to the hundreds of exhibitions he staged throughout the Midwest. In 1916 an enterprising auto maker cashed in on Cessna's publicity by providing Clyde a large shop in which Cessna built planes to attract attention to the "Jones Light Six" car being turned out there. Thus was born the first aircraft factory in Wichita, later to become the "air capital of the

Cessna's first full-cantilever wing made this 4-place Comet with 120-hp. Anzani the first U. S. aircraft without wing struts. This is the 1927 airplane with which Clyde organized the Cessna Aircraft Company.

CONTINENTAL

180

SKYWAGON

CESSNA ANNIVERSARY FLEET

182

SKYLANE

150

210

172

SKYMASTER

SKYLARK

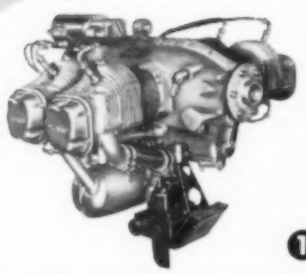
310

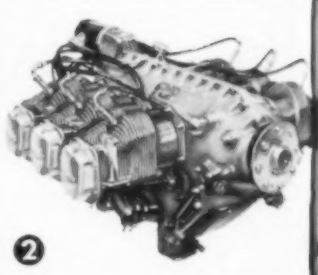
SKYKNIGHT

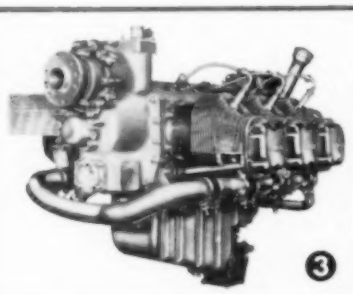
SKYHOOK

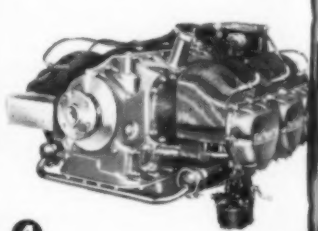
SKYHAWK

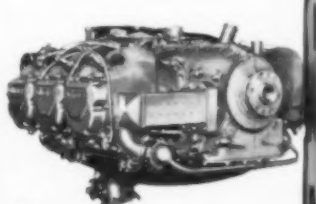
This symbol—more than a representation of 50 years past—is a promise for the future: the biggest advance in business airplane features and design.

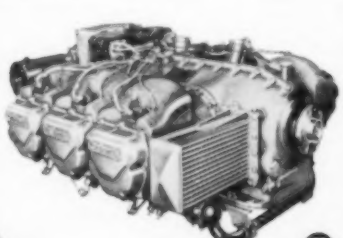


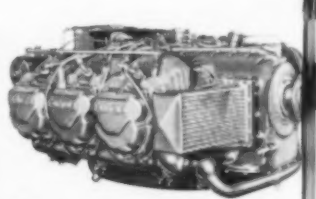












ABALUTES CESSNA

0 years of progress

RED SEAL POWER FOR THE CESSNA ANNIVERSARY FLEET

1 MODEL 0200-A

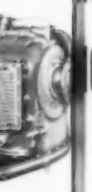
2 ODEL 0300-C,D

3 ODEL G0300-E

4 MODEL 0470-R

5 DDEL FS0526-A

6 MODEL 10470-F



7 ODEL 10470-D

8 ODEL TS10470

Aviation has made tremendous strides since the day in 1912 when Clyde Cessna flew his Silver Wings at 50 miles an hour. The intervening years have seen the evolution of the airplane from a scientific novelty into a major mode of transport, with steadily-growing impact on all phases of life. For the energy and vision of industry leaders like Cessna have transformed yesterday's toy into an indispensable tool. On the basis of utility alone, the airplane has earned for itself a place second only to the motor car in its benefits to mankind.

Cessna Aircraft Company and Continental Motors have long been privileged to work together in the interests of flying. Both can find satisfaction in the knowledge that their endeavors have helped aviation to advance.

It is fitting that Continental should join in saluting the Cessna Aircraft Company, its distributors and its dealers, on 50 years of aviation progress. It is natural, too, that Continental should take special pride in the fact that the entire Cessna Anniversary Fleet flies with Continental power.

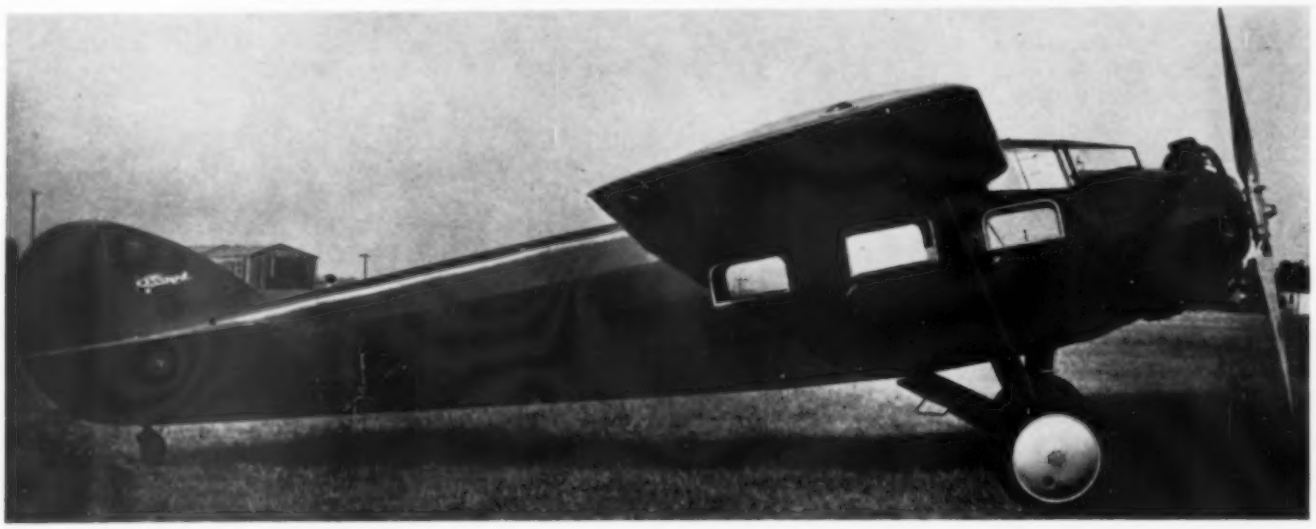
CONTINENTAL MOTORS · Powerful as the Nation · AMERICA'S STANDARD ®

Continental Motors Corporation

AIRCRAFT ENGINE DIVISION

MUSKEGON • MICHIGAN

Cessna Aircraft Company's first production airplane was the 125-hp., 130-mph., $7,115 4-place A series of 1928-29, shown above. Sixty-nine were produced. Below is the first Cessna produced in the present plant — it is the 4-place 1929-35 DC-6 series, of which 86 were produced with 225-300-hp., 160-mph. top speed and $11,500 price.



world." He built two Cessnas in this plant — the first airplanes to be built in Wichita — and the second one, called the "Comet," was Clyde's first attempt at enclosing the cockpit. This 1917 model was good for 120-125 mph. and set speed records from town to town.

America's entry into World War I halted Cessna's barnstorming and airplane building and the intrepid airman returned to Rago, Kansas. There he farmed not only throughout the war but until 1925, when Walter Beech and Lloyd Stearman persuaded him to join them in organizing and operating the Travel Air Manufacturing Company in Wichita, with Cessna as president, Beech as vice president and Stearman as chief designer. By the end of their first year, they had produced and sold 19 Travel Air biplanes and production was boosted to 46 for 1926.

Biplanes were not for Clyde Cessna, however. His preference was the monoplane design from the time he saw his first Bleriot back in 1911. After hours at Travel Air, he developed a 4-place cabin monoplane of his own design in a rented shop and persuaded Beech and Stearman to produce it. It had a 225-hp. Wright Whirlwind engine. Improved versions won headline publicity in several 1927 trans-Pacific flights to Hawaii, including victory by Art Goebel and William Davis in the $25,000 Dole Air Derby from California to Hawaii. Despite this and the fact that Travel Air monoplanes became airliners for passengers and mail, the Travel Air Company's production was mostly biplanes and Clyde Cessna sold his interest and got out so he could devote his efforts to monoplanes.

In a shop of his own, Clyde designed and built a 4-place "Comet" featuring his first full-cantilever wing, first flying it in the summer of 1927 and then establishing the Cessna-Roos Aircraft Company to produce Comets. The prototype, which had a 120-hp. Anzani, was rebuilt to use a 225-hp. Wright J-5 Whirlwind, two doors for the cabin and an enclosed cockpit for the pilot. This efficient little high-wing was so clean it topped 150 mph. and became a racer. Windows were added later for the cabin and the 120-hp. Anzani replaced the J-5.

In December, Cessna's chief backer sold his interest back to Clyde and the name of the firm was changed on December 31, 1927, to become the Cessna Aircraft Company, this marking the origination of the company which exists today.

Cessna Aircraft Company's first production airplanes were called the "A" series of 1928 — a 4-place design with full-cantilever high wing, 2,260-lb. gross weight, fabric covered steel-tube fuselage and wooden wing. Five engine options were later offered — the AA with 120-hp. Anzani, the AW with 125-hp. Warner, the AS with

Cessna-built racers in 1931-33 included this 1933 CR-3, with 145-hp. Warner engine. Johnny Livingstone made headlines with its victories.

Dwane L. Wallace, Clyde Cessna's nephew, persuaded the company to reopen the Depression-closed factory in 1934 to produce the C34 designed that year. It became the popular 4-place Airmaster, in which Wallace won races and the title "World's Most Efficient Airplane" for its ability to cruise 145 mph. with a 145-hp. Warner engine.

125-hp. Siemans-Halske, the AC with 130-hp. Comet engine and the AF with 150-hp. Floco Axelson engine. Good for 130 mph., the highly-efficient "A" series proved popular, with the AW preferred because of its American engine. Earl Rowland, Cessna test pilot, flew an AW to victory in September, 1928, in the Class A Transcontinental Air Derby from New York to Los Angeles. Cessna also developed a beefed-up 3-place "BW" series in 1928, using a 220-hp. Wright J-5 to obtain a 150-mph. top speed at 2,435-lb. gross weight. Only 13 were produced, however, as the AW proved more popular.

Cessna Aircraft Company's first year of operations in 1928 proved impressive — it produced 46 airplanes, had accelerated production up to a rate of 2½ airplanes per week at year's end and had a backlog of 96 orders. It had also rolled out an impressive new prototype for a larger Model CW-6 with three doors, seats for 6 people, 225-hp. Wright J-5, span of 43 ft. 4 ins. and length of 30 ft. 4 ins. Still the showman, Cessna painted it a brilliant white with red trim and displayed it at an indoor auto show, complete with 6 department store mannequins sitting at the windows. Even more spectacularly, it was demonstrated on a tour through Mexico where it was confiscated by the Mexican government during a revolution and pressed into service dropping bombs onto the rebels (the Mexicans later paid Cessna for the CW-6).

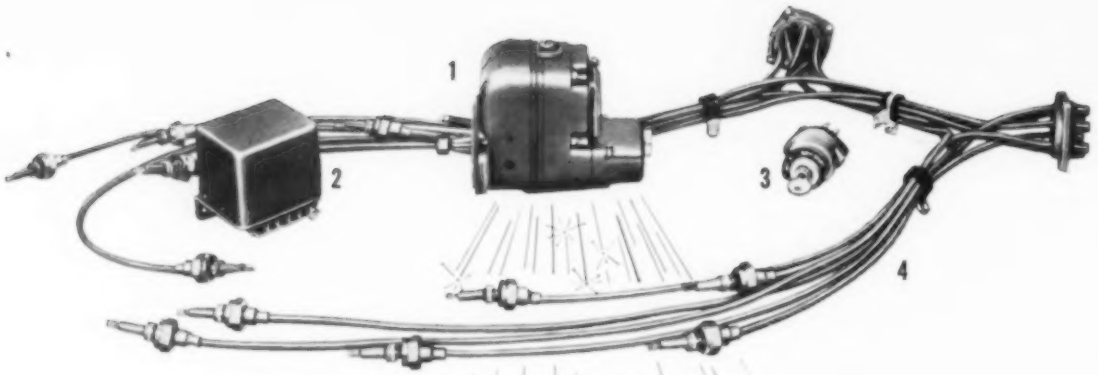
Production in 1929 got a shot in the arm when the Curtiss Flying Service contracted to take Cessna's entire production if the firm expanded factory facilities to build up to 50 airplanes per month. Until then, Cessna had only 5 dealers to handle its output. Now it began expanding production and simultaneously started constructing 5 new factory buildings. Before moving into the new Pawnee Road plant in Wichita, Cessna was producing 18 AW's per month. It rushed development of a new and larger 4-place DC-6 prototype, whose 170-hp. Curtiss Challenger engine gave way in the 3,180-lb. DC-6A "Chief" to a 330-hp. Wright and in the 3,100-lb. DC-6B "Scout" to a 250-hp. Wright. The Chief topped 155 mph. and cruised 130 mph. while the Scout topped 145 mph. and cruised 120 mph. When the move was made into the new plant, the AW series was phased out and replaced on the assembly lines with the DC-6A and B series.

Volume production had barely begun when the Wall Street crash in October, 1929, brought havoc to the Curtiss Flying Service, which went bankrupt to leave Cessna in debt with no market for its many airplanes. They continued rolling off the lines until Clyde Cessna could no longer meet the payroll and was forced to shut down.

Clyde Cessna was convinced that aircraft salesmanship could create demand despite the Depression. He sold an occasional airplane and began turning out little CG-2 primary training gliders, which had an empty weight of only 120 lbs., 35-ft. span and a landing speed of 15 mph. Complete with launching shock cord, the glider sold for only $398 and the Cessna plant built over 300 of them in 1930, along with a few DC-6A's and B's. Cessna's son, Eldon, who designed the glider in the belief that the future of the company was in minimum-size aircraft, built up a side-by-side two-seater known as the FC-1 with a 90-hp. Cirrus engine, and converted a CG-2 glider into a "Baby Cessna" with a 25-hp. Cleone engine, an enclosed single-seat cabin and a crude landing gear. From those two prototype designs he evolved the EC-1 single-seat Baby Cessna with 30-hp. Aeronca engine. None of the three went into production, for financial difficulties forced officers of the company to undertake only the building of special aircraft, mostly racers such as the 1932 CR-2 with 145-hp. Warner and retractable gear and the Warner-powered 1933 CR-3 which Johnny Livingstone raced extensively.

(Continued on page 46)

Developed during 1936-39, Cessna 5-place Model T-50 Bobcat executive twin, with 245-hp. Jacobs engines, was used in large numbers for war training, first in Canada and then in the U. S.



Instant ignition... through a shower of sparks

BENDIX S-200 IGNITION EQUIPS 80% OF NEW U. S.-BUILT BUSINESS AND PRIVATE AIRCRAFT

BENDIX IS PROUD TO SUPPLY IGNITION FOR THE

CESSNA ANNIVERSARY FLEET

Builders of fixed wing aircraft and helicopters, using four and six cylinder engines, have been quick to specify the Bendix® S-200 ignition system because of its easier starting, smoother running, and greater durability. It is now used on four out of five new business and private aircraft.

Quicker, surer starting is accomplished through a new concept in high tension ignition for aircraft. The ignition-starting energy formerly supplied by release of a mechanical impulse coupling is replaced in the S-200 system by a retard breaker and battery-operated starting vibrator which produce a "shower of sparks" at the spark plug. A completely new type of ignition switch automatically controls starting and operation of the ignition system. Radio shielding is improved on the S-200 system through use of the Bendix "feed-thru" capacitor feature.

Aircraft operators wanting the advantages of the S-200 system may obtain it to replace present ignition and are invited to contact Scintilla Division distributors for details; or write us in Sidney, New York.

1. Retard breaker magneto 2. Starting vibrator 3. Ignition and starter switch 4. Harness assembly

Scintilla Division THE Bendix CORPORATION

GOODYEAR

Chances are they both flew Cessnas

Flying has come a long way in 50 years—and so has Cessna Aircraft Corporation.

Goodyear, through its Aviation Products Division, has been supplying aircraft wheels, brakes and tires for most of those 50 years. On this, Cessna Aircraft Corporation's Golden Anniversary, we offer our congratulations to a company which builds some of the world's finest aircraft.

GOODYEAR

Cessna "A", 1928-29, with 120-hp. Anzani

Model BW had 220-hp. Wright J-5

Cessna Productio

DC-6 series offered 250-330-hp. Wrights in 1929-34

Single-seat Cessna glider sold for $398

Still flying in 1961 was this 1935 C-34

Over 5,000 T-50 Bobcats were built for war training

CESSNA Aircraft Company has manufactured over 42,500 aircraft in the 34 years since the company produced its first Model A's in 1928. Of the total, approximately 11,000 have been built for the armed forces, including 3,292 L-19 Bird Dogs and 5,399 twin-engine T-50 (UC-78) trainers.

Cessna's output of Model 180-182-185's has totaled 9,165, exceeding that of any Cessna series. The company has produced 8,938 of the 120-140-150 series, 5,756 Model 172's, 2,076 Model 175's, 1,676 Model 310 twins, and 1,056 Model 210's.

The popularity and reliability of the 170 series, which went out of production in 1956 after 5,170 had been built, and the 190-195 series, 1,188 of which were built between 1947 and 1954, is evidenced by the large numbers still flying. Today it is not uncommon to see a 13-year-old 170 sell for 75% of its original value, or a Model 140, priced at $3,345 in 1946, bringing $3,000.

The following tabulates Cessna's production through the years:

Model	Type	Engine	Year of Manf'r.	Latest Price	Quantity Built
AW	4-pl. fabric-covered full-cantilever high-wing single-engine	110 and 125 hp. Warner Scarab	1928 and 1929	$6,900 Wd. Prop $7,115 Mtl. Prop	58
AA	4-pl. fabric-covered full-cantilever high-wing single-engine	120-hp. Anzani	1928	$6,300 Wd. Prop $6,500 Mtl. Prop	136
AS	4-pl. fabric-covered full-cantilever high-wing single-engine	125-hp. Siemans-Halske	1928	$7,200 Wd. Prop $7,525 Mtl. Prop	2

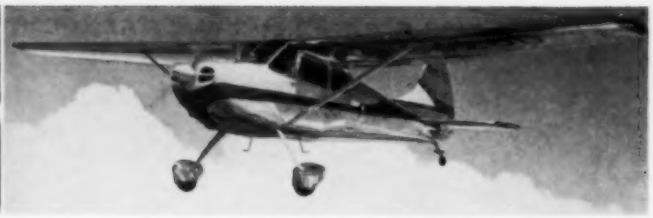
First all-metal Cessna was 1947 Model 190

Cessna built 750 CG-4A invasion gliders in 1942

Production reached 30 2-pl. Model 120-140's daily in 1946

Plush Model 140 went to metal wing in 1949

Four-place 170 was developed from Model 140



Metal wing with large flaps identified 170B

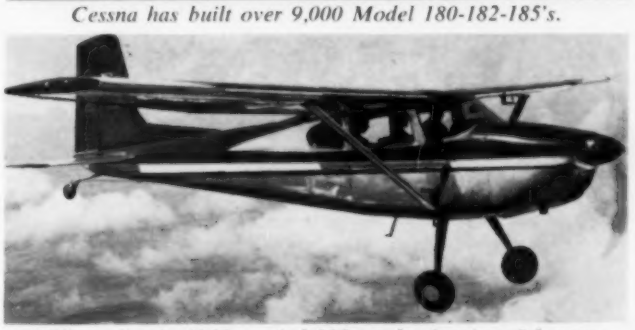
tioAircraft, 1928-1961

Model	Type	Engine	Year of Manf'r.	Latest Price	Quantity Built
AC	4-pl. fabric-covered full-cantilever high-wing single-engine	150-hp. Comet	1928	$6,800 Wd. Prop $7,000 Mtl. Prop	1
AF	4-pl. fabric-covered full-cantilever high-wing single-engine	150-hp. (Floco) Axelson	1928	$7,200 Wd. Prop $7,525 Mtl. Prop	2
BW	3-pl. fabric-covered full-cantilever high-wing single-engine	220-hp. Wright J-5	1928	$8,500	13
DC-6	4-pl. fabric-covered full-cantilever high-wing single-engine	170-hp. Curtiss Challenger R-600	1929	$9,200	1
DC-6A	4-pl. fabric-covered full-cantilever high-wing single-engine	330-hp. Wright R-975	1929, 1930 & 1934	$11,500	24
(Note: Army purchased 4 in 1942 and designated as UC-77)					
DC-6B	4-pl. fabric-covered full-cantilever high-wing single-engine	250-hp. Wright R-760	1929, 1930 & 1934	$10,000	25
(Note: Army purchased 4 in 1942 and designated as UC-77A)					
CG-2	1-pl. high-wing fabric-covered training glider	No Engine	1930	$398	300
C-34 Airmaster UC-77B (Army bought two in 1942)	4-pl. fabric-covered full-cantilever high-wing single-engine	145-hp. Warner Super Scarab	1935 & 1936	$4,995	43
C-37 Airmaster UC-77C (Army bought one in 1942)	4-pl. fabric-covered full-cantilever high-wing single-engine	145-hp. Warner Super Scarab	1937	$5,490	46
C-38 Airmaster	4-pl. fabric-covered full-cantilever high-wing single-engine	145-hp. Warner Super Scarab	1938	$5,500	15
C-145 Airmaster	4-pl. fabric-covered full-cantilever high-wing single-engine	145-hp. Warner Super Scarab	1938 through 1941	$7,875	41
C-165 Airmaster	4-pl. fabric-covered full-cantilever high-wing single-engine	165-hp. Warner Super Scarab	1939 through 1941	$8,275	38
(Army purchased 3 in 1942 from owners and designated UC-94)					
C-165D Airmaster	4-pl. fabric-covered full-cantilever high-wing single-engine	165-hp. Warner Super Scarab D	1941	$9,825	3
T-50	5-pl. fabric-covered full-cantilever low-wing twin-engine	245-hp. Jacobs L4MB	1940 & 1941	$29,675	40
(Later taken over by USAAF as UC-78A)					

Cessna L-19 was first produced in 1950

Marines used OE-2 version of the Bird Dog

Cessna has built over 9,000 Model 180-182-185's.



"D" version in 1961 carried 180 production into 9th year

Flat nacelles and tip tanks distinguish 310 Twin, shown in 1954 version (left) and 1961 "F" version at right.

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RESEARCH, DESIGN, DEVELOPMENT AND PRODUCTION OF ELECTRONIC EQUIPMENT SINCE 1928

Model 182 first appeared in 1956. At right is 182C of 1960 with swept tail and extra windows.

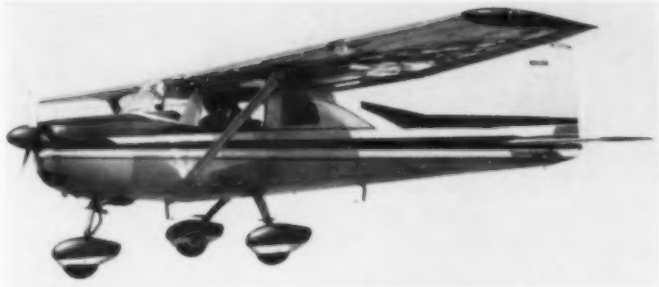
First Cessna tricycle gear was on 1956 Model 172

Swept tail and shortened gear mark 172B Skyhawk

Model 175 of 1958 with 175-hp. Continental GO-300-A.

Skylark version of Model 175A

Model	Type	Engine	Year of Manf'r.	Latest Price	Quantity Built
T-50 Crane I (Procured by Canada)	5-pl. fabric-covered full-cantilever low-wing twin-engine	245-hp. Jacobs L4MB	1940 & 1941	$30,825	640
T-50 AT-17A Crane II Bobcat (Procured by USAAF and sent to Canada via Lend Lease as Crane IA)	5-pl. fabric-covered full-cantilever low-wing twin-engine	245-hp. Jacobs R-755-9	1941	$20,660	190
T-50 AT-8 Bobcat (Procured by USAAF)	5-pl. fabric-covered full-cantilever low-wing twin-engine	240-hp. Lycoming R-680	1941	$25,510	33
T-50 AT-17 Bobcat (Procured by USAAF)	5-pl. fabric-covered full-cantilever low-wing twin-engine	245-hp. Jacobs R-755-9	1942	$19,100	450
T-50 AT-17A Bobcat (Procured by USAAF)	5-pl. fabric-covered full-cantilever low-wing twin-engine	245-hp. Jacobs R-755-9	1942	$19,100	33
T-50 AT-17B Bobcat (Procured by USAAF)	5-pl. fabric-covered full-cantilever low-wing twin-engine	245-hp. Jacobs R-755-9	1942 & 1943	$19,100	466
T-50 AT-17C Bobcat (Procured by USAAF)	5-pl. fabric-covered full-cantilever low-wing twin-engine	245-hp. Jacobs R-755-9	1943	$19,100	60
T-50 AT-17D Bobcat (Procured by USAAF)	5-pl. fabric-covered full-cantilever low-wing twin-engine	245-hp. Jacobs R-755-9	1944	$19,100	131
T-50 UC-78 Bobcat (Procured by USAAF)	5-pl. fabric-covered full-cantilever low-wing twin-engine	245-hp. Jacobs R-755-9	1942	$16,450	1,354
T-50 UC-78B Bobcat (Procured by USAAF)	5-pl. fabric-covered full-cantilever low-wing twin-engine	245-hp. Jacobs R-755-9	1942 & 1943	$16,450	1,806
T-50 UC-78C Bobcat (Procured by USAAF)	5-pl. fabric-covered full-cantilever low-wing twin-engine	245-hp. Jacobs R-755-9	1942, 1943 & 1944	$16,450	196
CG-4A (Procured by USAAF. Glider was designed by Waco and produced by Cessna)	Strut-braced, high-wing fabric-covered cargo glider	No Engine	1942	$27,650	750
120	2-pl. metal with fabric-covered strut-braced high-wing single-engine	85-hp. Cont'l. C85-12 & -12F	1946 through 1948	$2,845	2,164
140	2-pl. metal with fabric-covered strut-braced high-wing single-engine	85-90-hp. Cont'l. C85-12 & -12F & C90 -12F	1946 through 1948	$3,345	4,881
140A	2-pl. metal with strut-braced high-wing single-engine	85-90-hp. Cont'l. C-85-12F & -14F C-90-12F & -14F	1949 through 1951	$4,495	525
170	4-pl. metal with strut-braced fabric-covered high-wing single-engine	145-hp. Cont'l. C-145-2	1948	$5,475	729
170A	4-pl. metal strut braced high-wing single-engine	145-hp. Cont'l. C-145-2 & -2H	1949 through 1951	$7,245	1,538
170B	4-pl. metal strut-braced high-wing single-engine	145-hp. Cont'l. C-145-2 & -2H O-300-A	1952 through 1956	$8,295	2,903
172	4-pl. metal strut-braced high-wing single-engine	145-hp. Cont'l. O-300-A	1956 through 1959	$9,250	3,754
175	4-pl. metal strut-braced high-wing single-engine	175-hp. Cont'l. GO-300-A	1958 through 1959	$11,250	1,237
180	4-pl. metal strut-braced high-wing single-engine	225-230-hp. Cont'l. O-470-A, -J & -K	1953 through 1956	$12,950	2,662
180A	4-pl. metal strut-braced high-wing single-engine	230-hp. Cont'l. O-470-K	1957 & 1958	$13,850	693
182	4-pl. metal strut-braced high-wing single-engine	230-hp. Cont'l. O-470-L	1956	$13,750	843
182A	4-pl. metal strut-braced high-wing single-engine	230-hp. Cont'l. O-470-L	1957 & 1958	$14,350	1,713 incl. 182A Skylane
182A Skylane	4-pl. metal strut-braced high-wing single-engine	230-hp. Cont'l. O-470-L	1958	$16,850	
190	5-pl. metal full-cantilever high-wing single-engine	240-hp. Cont'l. W670-23	1947 to 1953	$16,500	233

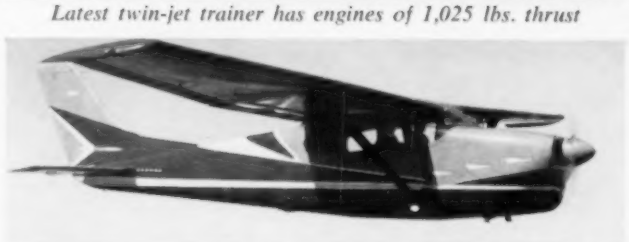


Cessna revived 2-place output in 1959 with Model 150

New Model 185 Skywagon is stretched Model 180

CH-1C Skyhook has supercharged 270-hp. Continental

Latest twin-jet trainer has engines of 1,025 lbs. thrust



Retractable gear distinguished Cessna Model 210

Model	Type	Engine	Year of Manf'r.	Latest Price	Quantity Built
195	5-pl. metal full-cantilever high-wing single-engine	300-hp. Jacobs R-755A-2	1947 to 1953	$23,500	446
195A	5-pl. metal full-cantilever high-wing single-engine	245-hp. Jacobs R-755-9	1950 to 1953	$15,795	211
195B	5-pl. metal full-cantilever high-wing single-engine	275-hp. Jacobs R-755B-2	1952 to 1953	$18,750	115
A195	5-pl. metal full-cantilever high-wing single-engine	300-hp. Jacobs R-755A-2	1953 & 1954	$24,700	6
A195B	5-pl. metal full-cantilever high-wing single-engine	275-hp. Jacobs R-755B-2	1953 & 1954	$19,950	94
195 LC-126A	5-pl. metal full-cantilever high-wing single-engine	300-hp. Jacobs R-755A-2	1950	negotiated	15
(Procured by USAF)					
195 LC-126B	5-pl. metal full-cantilever high-wing single-engine	300-hp. Jacobs R-755A-2	1951	negotiated	5
(Procured by National Guard)					
195 LC-126C	5-pl. metal full-cantilever high-wing single-engine	300-hp. Jacobs YR-755-11	1952	negotiated	63
(Procured by US Army)					
305A L-19A Bird Dog	2-pl. metal strut-braced high-wing single-engine	213-hp. Cont'l. O-470-11	1950 through 1954	negotiated	2,359
(U. S. Army 2,130, National Guard 190, MDAP 13, Chile 6, USAF 20)					
305A L-19A Inst. Trainer	2-pl. metal strut-braced high-wing single-engine	213-hp. Cont'l. O-470-11	1953	negotiated	69
(Procured by US Army)					
305A OE-1 XL-19B XL-19C	2-pl. metal strut-braced high-wing single-engine	213-hp. Cont'l. O-470-11	1951 & 1957	negotiated	60
		Boeing XT-50-BO-Turboprop	1952	$17,050	1
		Continental Turbomeca XT-51-T-1 Artouste I	1953	$18,000	2
(305A & OE-1 were Navy, XL-19B & C were USAF)					
305B TL-19D Inst. Trainer	2-pl. metal strut-braced high-wing single-engine	213-hp. Cont'l. O-470-15	1956 & 1958	negotiated	310
(Procured by US Army)					
305C L-19E Bird Dog	2-pl. metal strut-braced high-wing single-engine	213-hp. Cont'l. O-470-11	1957 & 1959	negotiated	458
(MDAP 53, France 90, U. S. Army 306, Canada 9, France 36)					
305C OE-1	2-pl. metal strut-braced high-wing single-engine	213-hp. Cont'l. O-470-11	1957 1959	negotiated negotiated	2 2
(Procured by US Navy)					
321 OE-2	2-pl. metal strut-braced high-wing single-engine	265-hp. Cont'l. O-470-2	1955	negotiated	25
(Procured by US Navy)					
310	5-pl. metal full-cantilever low-wing twin-engine	240-hp. Cont'l. O-470-B & -M	1954 to 1957	$54,950	546
310A L-27A U-3A	5-pl. metal full-cantilever low-wing twin-engine	240-hp. Cont'l. O-470-M	1957 & 1958	$51,500	160
(Procured by USAF)					
310B	5-pl. metal full-cantilever low-wing twin-engine	240-hp. Cont'l. O-470-M	1957 & 1958	$59,950	228
318A T-37A	2-pl. metal full-cantilever low-wing twin-jet	920-lbs. thrust Cont'l. J69-T-9	1955 through 1959	negotiated	398
CH-1B YH-41	4-pl. metal fuselage single-rotor single-engine helicopter	270-hp. Cont'l. FSO-526-A	1957	negotiated	10
(Procured by US Army)					
325A	2-pl. metal strut-braced high-wing single-engine	225-hp. Cont'l. O-470-J & -A	1953	$12,750	4
(Agricultural airplane sold by Cessna without dust or spray equipment — customers modified to suit operations.)					
310C	5-pl. metal full-cantilever low-wing twin-engine	260-hp. Cont'l. IO-470-D	1959	$59,950	259
310D	5-pl. metal full-cantilever low-wing twin-engine	260-hp. Cont'l. IO-470-D	1960	$59,950	278
150	2-pl. metal strut-braced high-wing single-engine	100-hp. Cont'l. O-200-A	1959 1960	$6,995 $7,250	1,018
180B	4-pl. metal strut-braced high-wing single-engine	230-hp. Cont'l. O-470-K	1959	$14,250	306
180C	4-pl. metal strut-braced high-wing single-engine	230-hp. Cont'l. O-470-L	1960	$14,675	250
182B	4-pl. metal strut-braced high-wing single-engine	230-hp. Cont'l. O-470-L	1959	$14,600	802 incl. Skylane
182B Skylane	4-pl. metal strut-braced high-wing single-engine	230-hp. Cont'l. O-470-L	1959	$17,095	—
182C	4-pl. metal strut-braced high-wing single-engine	230-hp. Cont'l. O-470-L	1960	$14,890	649 incl. Skylane
182C Skylane	4-pl. metal strut-braced high-wing single-engine	230-hp. Cont'l. O-470-L	1960	$17,325	

CESSNA AIRCRAFT PRODUCTION, 1928-1961

(Continued from preceding page)

Model	Type	Engine	Year of Manf'r.	Latest Price	Quantity Built
172A	4-pl. metal strut-braced high-wing single-engine	145-hp. Cont'l. O-300-A	1960	$9,450	992
175A	4-pl. metal strut-braced high-wing single-engine	175-hp. Cont'l. GO-300-C	1960	$11,600	539 incl. Skylark
175A Skylark	4-pl. metal strut-braced high-wing single-engine	175-hp. Cont'l. GO-300-C	1960	$13,050	—
210	4-pl. metal strut-braced high-wing single-engine	260-hp. Cont'l. IO-470-E	1960	$22,450	575
318B T-37B	2-pl. metal full-cantilever low-wing twin-jet	1,025-lbs. thrust Cont'l. J69-T-25	1959		—
150A	2-pl. metal strut-braced high-wing single-engine	100-hp. Cont'l. O-200-A	1961	$7,495	350
172B	4-pl. metal strut-braced high-wing single-engine	145-hp. Cont'l. O-300-C	1961	$9,795	1,010 incl. Skyhawk
172B Skyhawk	4-pl. metal strut-braced high-wing single-engine	145-hp. Cont'l. O-300-D	1961	$11,475	—
175B	4-pl. metal strut-braced high-wing single-engine	175-hp. Cont'l. GO-300-C	1961	$11,995	300 incl. Skylark
175B Skylark	4-pl. metal strut-braced high-wing single-engine	175-hp. Cont'l. GO-300-D	1961	$13,775	—
180D	4-pl. metal strut-braced high-wing single-engine	230-hp. Cont'l. O-470-L	1961	$15,275	100
185 Skywagon	4-pl. metal strut-braced high-wing single-engine	260-hp. Cont'l. IO-470-F	1961	$18,950	—
182D	4-pl. metal strut-braced high-wing single-engine	230-hp. Cont'l. O-470-L	1961	$15,490	910 incl. Skylane
182D Skylane	4-pl. metal strut-braced high-wing single-engine	230-hp. Cont'l. O-470-L	1961	$17,950	—
210A	4-pl. metal strut-braced high-wing single-engine	260-hp. Cont'l. IO-470-E	1961	$23,450	481
310E	5-pl. metal full cantilever low-wing twin-engine	260-hp. Cont'l. IO-470-D	1960	—	1
310E U-3B	5-pl. metal full cantilever low-wing twin-engine	260-hp. Cont'l. IO-470-D	1961	negotiated	35
310F	5-pl. metal full-cantilever low-wing twin-engine	260-hp. Cont'l. IO-470-D	1961	$62,500	169
CH-1C Skyhook	4-pl. metal single-rotor single-engine helicopter	270-hp. Cont'l. FSO-526-A	1961	$79,960	—

50 YEARS OF CESSNA

(Continued from page 37)

Dwane L. Wallace, a newly-graduated aeronautical engineer and Clyde Cessna's nephew, joined the company in 1934 as general manager and talked the owners into re-opening the plant to produce an improved version of the AW designated as the C-34 and powered by a 145-hp. Warner. It won races, was named the "Airmaster" beginning with the C-37 series and C-145 and C-165 versions were built.

Clyde Cessna sold his interest in the company in 1936 to his nephews, retiring to the farm, Dwane Wallace becoming president. That same year Dwane flew the 4-place Airmaster to victory at Miami to win permanent possession of the Detroit News Trophy and the "World's Most Efficient Airplane" title. The 1937 Cessna C-37 Airmaster with 145-hp. Warner topped 162 mph., cruised "a mile per hour per horsepower," grossed 2,250 lbs. with a 1,315-lb. empty weight, climbed 1,000 fpm., was equipped with electric flaps and plush interior.

But Cessna struck pay dirt when it developed its T-50 twin-engine, 5-place executive transport with retractable landing gear and powered by two 245-hp. Jacobs R-755's. It came out in 1939 after three years of development. Despite good sales of the Airmaster and T-50 Bobcat, the company's bank account was down to only $5.03. But Dwane Wallace sold the British on using the twin as a trainer for bomber pilots and large orders for it were obtained from the Royal Canadian Air Force, which designated the Cessna as the Crane. With U. S. entry into World War II in 1941, the T-50 was used in large numbers by the U. S. Army Air Force. It was the AT-8 with 240-hp. Lycoming R-680 engines and the AT-17 and UC-78 with Jacobs R-755-9 engines but became more familiarly known as the "Double-breasted Cub" and "Bamboo Bomber." War production by Cessna included close to $200,000,000 worth of Bobcats, gliders and parts for Boeing and Douglas.

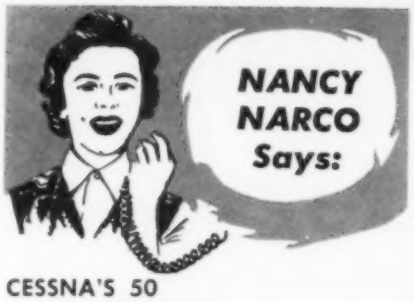
Re-conversion to non-military aircraft following World War II challenged Cessna's ingenuity to utilize the over-size production facilities and army of skilled aircraft workers which war production had created. But within five months Cessna introduced its postwar Model 120-140 series of 2-place personal planes. Large-scale pent-up demand for private planes had accumulated among private fliers, whose ranks suddenly began to burgeon with military-trained pilots and servicemen swarming to GI flight training programs, and Cessna's little two-seaters became so popular that production reached the unheard-of rate of 30 airplanes daily in the summer of 1946, nearly 4,000 deliveries being made that year for an all-time record in commercial aircraft output.

The larger 5-place, 160-165-mph., Model 190-195 series, powered with 240-hp. Continental and 300-hp. Jacobs radial engines, respectively, was introduced in 1947 followed by the 4-place, 145-hp. Continental-powered, 120-mph. Model 170 in 1948.

Whereas the Model 120-140 series proved excellent for the purpose of getting the growing legion of private fliers into the air, these and many thousands of other makes of 2-place aircraft rapidly piled up an oversupply. But the 4-place Model 170 proved to offer more cross-country travel and passenger-comfort usefulness at not much more cost than that of the limited-utility 2-place models. While the demand for 2-place personal craft disappeared, the 4-place type took hold immediately and formed the basis for a growing volume of "business aircraft" flying.

Salesmanship in business planes became one of Cessna's greatest achievements, as important to the company's success as Clyde Cessna's design genius in sticking to the monoplane concept which led to the Airmaster's recognition as the world's most efficient airplane in its day. Most people in private flying promotion were either pilots or mechanics and their major concern was either piloting or working on lightplanes — airplane salesmen who could close sales profitably were a rarity, as were factory efforts to create a thriving and profitable market. Cessna was the first manufacturer to go all-out in aircraft sales promotion geared to "the hard sell" and full-scale merchandising. The decision was made in 1951 and Cessna's advertising budget for 1952 dramatized its intentions to capture a big share of the market — it skyrocketed from $37,000 per year to $250,000 per year and was ballooned upward with expansion of its line of planes and its sales-service dealer network.

Although business planes had become Cessna's primary interest, it continued developing military aircraft and diversified into other commercial activities. It began manufacturing industrial hydraulics units in 1946, supplying farm machinery manufacturers such as International Harvester, Oliver and John Deere. It developed a line of furniture for military bases into a temporary but multi-million-dollar activity, replacing this with im-



CESSNA'S 50

NARCO'S 15

Fifty years of Progress at Cessna covers almost the whole span of aviation history. It was less than sixty years ago that the Wright brothers first flew. We're mighty pleased and proud to have been a part of Cessna's most dynamic decade — the last ten years — and to see our equipment offered in the great new Anniversary Line. Near as we can figure, we've shipped 9,435 Narco radios to Wichita for installation in new production Cessna airplanes, and we know a large majority of Cessnas flying are Narco-equipped.

The progress experienced by general aviation has been due both to the development of reliable, high performance, new airplane designs — look at Cessna's Anniversary Line for '62 —*and* to the much greater ease in getting around the country electronically. Omni, for instance, really broke the ice in simplifying navigation . . . has made it possible for relatively inexperienced beginners to fly safely and certainly cross-country. VHF radio has taken the uncertainty out of communications.

Just as Cessna has pioneered so many improvements, we are proud of our role as pioneers in radio navigation and communications. 15 years ago when Narco started up, navigation and communications equipment for private airplanes was about as primitive as flying itself was 50 years ago. Narco pioneered Omni for private aviation, and practically-priced VHF communications. Since then, over 55,000 Narco Omni-navigation equipments have been built — over 100,000 Narco units of all kinds!

But most exciting is the future. Take DME, for instance. It's coming into its own with a bang. American Airlines widely hails DME as the "most significant advance in airline navigation, beyond even radar." It provides the final bit of navigation information that has heretofore been left to estimate — distance (and therefore time) to or from a station. It is new equipment like this which will make flying even simpler and more reliable.

That's why we share the enthusiasm for the future shown by the people at Cessna and their great sales organization. Congratulations to Cessna on your first fifty and a salute to the next fifty.

Regards,

Nancy

NARCO • Fort Washington, Pa.

AMERICAN AIRLINES FLATLY TERMS

DME

"the most significant advance ever made in airline navigation, beyond even radar"

YOU, TOO

will agree when you install

narco DME

NARCO UDI-2 . . .
the *only* DME available for business aircraft
at a practical weight (16 lbs),
practical size (Narco Mark size),
and practical price ($2250).

P.S. Hundreds of Narco DME's are already installed in everything from 172's to Convairs and are performing with amazing accuracy and reliability. Production's working overtime and still the backlog builds up. To get DME soon, get your order in NOW. See your nearest Narco distributor or write for DME brochure, Dept. F-11, NARCO, Fort Washington, Pa.

portant military aircraft subcontracts for Boeing, Lockheed and Republic Aviation. In 1949 Cessna brought out its L-19 Bird Dog 2-place all-metal liaison observation airplane which has continued in production with over 3,000 L-19's having been produced by the end of 1961. Cessna acquired the Seibel Helicopter Company in 1952 and last year began marketing the 4-place CH-1 Skyhook series. A small quantity of copters have gone to the military for evaluation.

Cessna entered jet aircraft development in 1953 when its twin-jet T-37 was selected by the Air Force for its first jet basic trainer, which featured 400-mph. performance and side-by-side seating. The T-37 made its first flight in 1954 and has since been produced in quantity. The company has never offered the jet commercially, believing the market has not yet developed for its large-scale acceptance.

More interested in dominating the small business aircraft market than anything else, Dwane Wallace guided Cessna's product development and merchandising along automotive lines during the 1950's. From the Model 170 and Model 190 series he began creating a complete line of lightplanes by adding the high-performance 4-place Model 180 in 1953. Its modern 230-hp. Continental O-470 gave it the 160-mph. performance of the obsolete Model 190 series. The 180 on floats became the finest light seaplane ever produced. The following year, in 1954, Cessna introduced its high-performance 5-place twin, the Model 310, powered by two 240-hp. Continental O-470's and good for 220 mph. This Cessna pioneered very thin engine nacelles for twins by retracting the main wheels into the wing instead of using fat nacelles to house them. They were housed in the wing section other aircraft used for fuel tanks, but the 310 carried its fuel in tip tanks — the first light twin designed for them.

Tricycle landing gear for its single-engine lightplanes was introduced in the 1955 Model 172 refinement of the Model 170 and was featured in the Model 182 development of the 180 series. Sales zoomed with the tricycle gear bringing new ease of ground handling, making Cessnas more useful than ever to flying businessmen. In 1959, Cessna had expanded its line of lightplanes to 7 different models, boosting it to 9 models in 1960 and to 12 in 1961, with 13 models being offered for 1962, completely blanketing the market.

Success of Dwane Wallace's formula of merchandising with a full line of airplanes plus diversification into other activities is shown in the build-up of sales for Cessna. The company's sales multiplied from $32 million in 1951 to $57 million in 1955, $79.5 million in 1957, $95 million in 1958, and $105.7 million in 1959. Profits after Federal taxes ballooned even more — from $1.1 million in 1951 to $7.9 million in 1959, and the company's assets multiplied from $20 million to $38 million during the same time. In 1960, Cessna's commercial aircraft sales hit an all-time record of $56 million.

Newest Cessna business plane is the distinctive Skymaster, the first tandem-engine 4-place twin. With details to be announced with the 1962 line, this radical method of engine-twinning a lightplane will achieve the long-sought goal of giving the single-engine pilot twin-engine reliability. Since the engines are centered fore and aft, failure of one does not produce serious yaw as with wing-mounted engines.

Another first in light twins has been achieved by Cessna in its 1962 line with the Model 320 Skyknight development from the 310. The Skyknight is the first light twin equipped with turbo-superchargers, which utilize exhaust gases to provide sea level power up to 16,000 ft. These are low-cost automotive-type turbochargers adapted to aircraft engines from tractors, trucks and other work machines.

RADOME FOR CESSNA 310

Weather radar—with all of the increased safety, comfort and more efficient aircraft utilization that it makes possible — is now feasible for those who fly the popular Cessna 310.

Chamberlain's new radome — the first ever offered for this airplane — will accommodate either RCA or Collins lightweight radar with 12″ sector scan antenna.

Combining durability and high transmission efficiency, the new CAIR radome features X-Band honeycomb sandwich construction.

Designated CAIR Part No. 2014X, the complete radome assembly weighs only 30 lbs. and includes radome with built-in air scoop, fairing, stringers, secondary bulkhead, plenum chamber for relocating heater ducting, antenna mount, mud guard, glide slope antenna mounting bracket, nose gear door fairing and all necessary hardware. Nose gear need not be removed for installation. Also available is an airspeed relocation assembly which includes two pitot heads and masts. Complete installation drawings and instructions are supplied with both assemblies.

Know what's ahead — use a CAIR Radome

CAIR STC-approved Radomes are in use on Douglas, Martin, Convair and Constellation commercial air-liners and on DC-3, Lodestar, Beechcraft, Cessna and other Executive Aircraft. Write, wire or phone for complete details on the CAIR Radome for your airplane.

Cair

Associate Member

CHAMBERLAIN AVIATION, INC.

Akron Municipal Airport • REpublic 3-6216 • Akron 6, O.

1938-A

TACTAIR SALUTES CESSNA'S 50th ANNIVERSARY OF PROGRESS

TACTAIR T-3

GOLD SEAL 3-AXIS AUTOPILOT

Available as factory-installed equipment in the entire single-engine Cessna line from 172C to 210B, the Tactair T-3 has established an enviable record of proven performance and trouble-free operation. Features the famous Tactair double-card Directional Gyro with Course Selector for precise, automatic setting or changing of course. Heading Lock and Heading Memory provide amazing cross-country flying ease. Pitch Control included as standard feature, too, plus optional Altitude Hold. Tactair's thoroughly proven pneumatic system provides smoothest operation with the "human touch," uses no electrical power. Backed by Tactair's famous full year Gold Seal warranty.

TACTAIR OFFERS THESE THREE FINE AUTOPILOTS FOR CESSNA'S GREAT NEW ANNIVERSARY LINE FOR '62

T-2 *Levelair*

Finest, smoothest, most useful two-axis autopilot available, with pilot-preferred Tactair Course Selector, Heading Lock and Heading Memory. Same proven Tactair pneumatic operation, with full year Gold Seal Warranty. FAA-approved on the 210, 185, 182, 180, 175 and 172. Quickly and easily installed by your Cessna distributor. Includes Directional Gyro and Artificial Horizon manufactured by Tactair to assure the finest gyro instruments ever built.

T-101

Amazing new Tactair autopilot that holds a straight course perfectly, makes turns automatically. Operates the famous Tactair pneumatic way, built to Tactair standards of quality, but priced far lower than any autopilot on the market. Easily installed on all single-engine Cessnas. Priced at only

$495

For full information on these fine autopilots see your Tactair distributor or write for literature on T-3, T-2 or T-101.

AUTOMATIC FLIGHT— As Important As Radio In Today's Busy Aircraft!

TACTAIR®
INCORPORATED
DIV. OF AIRCRAFT PRODUCTS CO.

BRIDGEPORT, PENNSYLVANIA
(SUBURBAN PHILADELPHIA)

FOR 20 YEARS SPECIALISTS IN PRECISION AIRCRAFT PNEUMATIC AND HYDRAULIC CONTROLS

A FLIGHT MAGAZINE

Interview with Dwane Wallace

1. In view of recent predictions both inside and outside the government, what is Cessna's marketing forecast of lightplane sales for the next five or ten years?

It is our opinion that the general aviation industry will continue to show strong growth during the 1960's as more individuals and companies turn to the private airplane for transportation.

We believe that the total active general aviation fleet, which presently includes approximately 75,000 airplanes, will number more than 110,000 airplanes by 1970.

While all phases of general aviation should reflect a healthy growth pattern during the next 10 years, we believe business flying will see the most rapid rate of growth and pleasure flying also will reflect a sizeable increase.

The total active business airplane fleet now numbers approximately 31,000 aircraft. It is reasonable to project this will increase to over 50,000 aircraft by 1970. There are approximately 29,000 airplanes now used almost entirely for pleasure. A 10,000 airplane increase in this category during the next decade seems entirely realistic.

Categorizing the active general aviation fleet by class, it is our opinion that the light twin-engine aircraft, with 750 hp. or less, will show the most rapid growth rate during the next decade. The present light twin fleet is made up of approximately 7,500 aircraft and could number over 22,000 aircraft by 1970.

Based on our market research activity, heavy single-engine aircraft of three places or more with 200 or more horsepower, will show the next largest growth, closely followed by light single-engine aircraft.

While the general aviation industry encountered a temporary setback in 1961, we believe 1962 shows signs of a healthy recovery, providing economic conditions continue the upward swing that has been experienced recently.

2. Do you agree with the Project Horizon Report that evolution, not revolutionary developments, will mark technical progress in general aviation during the next decade?

While there are always possibilities of major breakthroughs in certain areas of general aviation technical progress, it is our opinion that progress will be evoluntionary rather than revolutionary. We believe that new and somewhat different designs will probably make their appearance with the advent of turbine power.

The conventional airplane design should continue to dominate the market. Like other manufacturers, we are continually evaluating design possibilities in other areas. The new Skymaster, with its tandem engine arrangement, is a good example of a product to come forth from unconventional design possibilities.

We believe it is very important to pursue experimental projects in both fixed as well as rotary-wing fields. Our number one responsibility is to meet the transportation requirements of industry and private individuals.

We also will continue to see accelerated progress in the field of guidance systems and communication/navigation aids which will further increase the utility of general aviation aircraft.

3. What are we, as an industry, failing to do toward accelerating wider public acceptance of aircraft for business, professional and recreational use?

The general aviation industry, like all others, has its limitations. It can expend only so many dollars and so much energy. The industry can't do all things for all people or be all things to all people.

In our opinion the industry must concentrate on a "rifle shot" operation and not attempt the "shotgun" technique. We spend a lot of time thinking and studying areas we aren't covering and how we can go about doing a better job.

This industry has done a good job in the past. We also realize we must do a better job in the future. To improve our industry, we must do the same job we have been doing only do it more effectively, and continually throw new ideas in the hopper.

Certainly, we need more good men as the industry grows. We need more dealers, we need more salesmen, we need more sales and service facilities, and we need to interest new people in coming into our business.

We also are alert to the area of air age education. The anticipated growth of the industry poses problems which must be jointly met and solved. The solution appears to lie in understanding, respect and support on the part of the general public and on the part of those who produce and those who use airplanes. These attitudes must grow from educational experiences. They cannot be developed by legislative and administrative controls.

Civic leadership, formal schools and vested interests of the industry must take the lead in providing realistic media through which aviation education will result in a fuller understanding and support.

We are certainly aware of the need for more airports which are mandatory for the expansion of our market. A system of airstrips located geographically to provide access comparable to our roads and highways is a must.

Facilities are vitally needed on all existing and new airports, including large metropolitan and international airports, for general aviation.

The development of separate airports to serve general aviation in large population areas will be necessary as air traffic and airport movements continue to grow.

The need to continually improve the integrated and common system of domestic airways, air naviation facilities and air traffic control facilities and services to accommodate the complexities of operating all types of aircraft under both VFR and IFR conditions safely and efficiently must receive the attention of both government and industry.

4. What is the significance of lightplane export sales booming while the domestic market has declined during the past year?

Looking at the overseas market, we see a need for airplanes that almost defies description. It is a virgin mar-

ket and certainly less competitive than our domestic market as far as other means of transportation are concerned.

In the domestic market, we have felt the impact of unfavorable economic conditions which began late last year and continued through the better part of this year.

The export market is responding to the world-wide merchandising efforts which have only recently been initiated by the industry.

Europe, for instance, is a good 10 years behind the U. S. in general aviation, but the continent has awakened and things are starting to boom. European economy has been good during the past year and has not felt the impact of unfavorable economic conditions as we have experienced here in the U. S.

We believe the overseas market will continue to show a high rate of growth, but the domestic market also will continue to show a healthy growth rate.

5. What is Cessna's philosophy behind staying with strut-braced, high-wing designs with fixed gear in its single-engine line after other manufacturers have gone almost completely to low-wing, retractable gear designs?

We believe the high-wing and low-wing designs for business and private airplanes will continue, without one design giving away to another. Each has certain advantages and disadvantages, but it is our opinion as a result of many years study that both will continue to be popular.

We build both high- and low-wing airplanes and use the configuration most appropriate for the airplane's intended use. Both the 310 and Skyknight have low-wing designs with retractable gear. The 210 is a high-wing with retractable gear, while the balance of the single-engine line is high-wing with fixed gear. The new twin-engine Skymaster also has the high-wing configuration with a fixed gear.

In the future, as in the past, Cessna will design its airplanes to meet the customers' desires and transportation requirements, be it high-wing or low-wing, fixed gear or retractable.

6. Has the state of the art in lightplane assembly-line production shown any signs of promising lower production costs or construction breakthroughs in the near future?

Progress in the general aviation industry in controlling costs through more effective production methods compares very favorably with other industries. A factual comparison will show that the industry has done a good job. We expect this to continue.

Many people do not stop to realize that there have been tremendous advances made in materials, manufacturing and production techniques. Plastics and aluminum alloys are good examples of advances in materials.

The proportionate increase in airplane prices during the past 20 years had been substantially less than for many other major durable items. It is realistic to believe that during the next 10 years, the private plane will cost less, for value received, in proportion to the incomes of businesses and individuals than it does today.

We think methods and techniques will continue to improve as they have in the past. We do not see any signs of major breakthroughs and would describe this continued improvement as evolutionary rather than revolutionary.

7. What are Cessna's plans for starting aircraft production in other parts of the world?

Cessna has always been interested in the world market and continues this interest. We are presently marketing aircraft in certain areas of the world where it may make more economic sense to assemble and manufacture aircraft in the area rather than transport them to overseas customers.

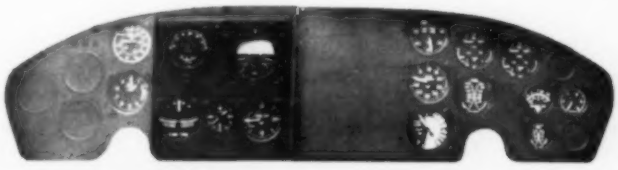
For the past 18 months, we have been negotiating with the Republic of Argentina and discussing the possibility of establishing an aircraft plant in that country.

WE SALUTE CESSNA

ON THEIR 50TH ANNIVERSARY

As major suppliers of both twin and single engine instrument panels and engine accessories, we are proud of our many years of close teamwork with Cessna.

Aviation's future will be brighter and safer with the kind of pioneering and engineering know-how that Cessna has demonstrated in the past 50 years.



Cessna 310 panel with Garwin *PICTORIAL GYRO TWINS*

GARWIN INC.

1326 South Walnut Wichita 13, Kansas

We also have surveyed other areas of the world and think they offer excellent possibilities for the future. This is not, however, something you accomplish overnight. It takes many months of investigation and analysis before a decision can be reached. While we are encouraged, we are not yet in a position to announce our international plans.

As you know, we have recently established a hydraulics plant in Scotland to serve the United Kingdom and European customers with agricultural and industrial hydraulic pumps, valves and cylinders. We believe this was a necessary move in the expanding world hydraulics market.

It is our opinion that in many areas, American industry is losing ground in the world-wide competitive race. Some industries today look sadly at their overseas potential and realize they have priced themselves out of a lot of good business.

American industry must become more competitive in the world-wide market if it wants to obtain or retain export business. In areas where this is not possible, it will be necessary to establish overseas manufacturing operations.

8. What is the general financial status of Cessna's average dealer? Has he been making a profit, has he accumulated any reserves, is his credit sufficient to satisfy Cessna's requirements for a complete line of aircraft, accessories and service facilities?

One of our most impressive assets is the tremendous growth that has been achieved by our dealer organization. New and remodeled dealer facilities designed to serve the customer are increasing in number throughout the country. These impressive installations are making a significant contribution toward establishing a more solid platform for the next decade.

Even more impressive are the fine organizations being built along with the brick and mortar. I refer to them as "even more impressive" because people are the real key.

We have made progress in improving the dealers' profit margins, but much remains to be done. We realize that we must accelerate this program which is a joint effort between Cessna dealers and Cessna.

No business can operate very well or very long without a reasonable profit. Profits create necessary reserves, sufficient credit and the dealer's ability to handle inventory and provide the service to the customer.

The customer is the most important consideration. Without satisfied customers, there would be no business. Serving our customers efficiently, honestly and conscientiously has been the key to the past success we have enjoyed and certainly will be the key to any future sucesses we may enjoy.

9. Do you believe that there is opportunity for young men and new enterprises in the sales and servicing end of general aviation or have all territories and franchises been fairly well saturated and closed?

We believe we are entering the "golden years." The next decade is filled with opportunities for individuals and organizations in this industry.

With our projected growth for the next decade, I believe opportunities are practically unlimited. Whether you are a customer, dealer, salesman or service man, I don't know any industry with more promise than this one.

The domestic market has great potential. The overseas market offers even more. For young men who are interested in hard work and the satisfaction of a job well done, here are tremendous career possibilities.

SUPERSONIC HOP AT AGE 78 was enjoyed during recent National OX5 Convention by Marcellus Murdock of Wichita, who first soloed in 1929 in an OX5 Travel Air and is now an active instrument pilot. Fastest flight was in USAF F-100 with Capt. Bill Hosmer (left), member of the Thunderbirds.

Plastic windows like new again!

New GLIDAIR windshield cleaner restores clarity and flexibility

Good visibility is a must for safe operation. And new GLIDAIR Windshield Cleaner brings back the visibility in scuffed or cloudy plastic windows . . . actually renews the surface, leaving it smooth and resistant to checking and cracking. Additional applications remove even fine scratches with minimum chalking.

New GLIDAIR Windshield Cleaner is easy to use, too. To make mars and smudges disappear, just rub it on, let dry, polish with a clean soft cloth . . . your windshield will be clear again.

Available in handy unbreakable bottles. Get some soon from your nearest private operator, or write direct. **Complete satisfaction or your money back!**

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INSTRUMENTAL IN TODAY'S CESSNA FLYING

KING *TOMORROW'S Aircraft Radio Equipment TODAY!*

Cessna, in its 50 years of progress, has contributed significantly to the advancement of general aviation. Over that half-century Cessna has witnessed, especially in recent years, an amazing development of radio equipment for safer, happier flying!

Today's general aircraft—equipped with the compact, lightweight communication and navigational units developed expressly for their special requirements by King Radio—flies with airliner security and accuracy!

Cessna has pioneered nobly in its half-century. King, a much more recent pioneer, is happy to provide radio equipment worthy of the fine planes it helps take-off, fly and land more safely and easily.

KING **KING RADIO CORP.**
Olathe, Kansas

Sold and installed by Certified Dealers in U. S. and Canada. Export by REA International, 80 Broad Street, New York

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Builders of TOMORROW'S Aircraft Equipment TODAY!

AIRCRAFT SHOWCASE

(Continued from page 29)

This was the question put to the meeting by Tom Harris, Aero Commander vice president and general manager, who said the onrushing state of the art caused his firm to bypass the turbo-prop in favor of a pure-jet Commander "because people are going to demand 500 mph. now that it is available." The new Model 1121 Jet Commander, with a firm price of $475,000, will be delivered in the final quarter of 1963.

Two other pure-jet designs which are being rushed in development were represented at the meeting. Bill Lear and his chief test pilot, Henry Beaird, spoke glowingly of the design capabilities of their new SAAC-23. Lear said his European company, Swiss American Aviation Corp., will fly the prototype next April, will certificate it next September, has already ordered production of 25 without dependence on advance customer orders, and will begin deliveries in the first half of 1963 with the price pegged at $250,000 bare or $350,000 complete with electronics, radio and interior. It is a 500-mph. twin-jet with seven seat belts and 11,700-lb. gross weight. Still another 500-mph. competitor is the twin-jet, 7-place Douglas-Piaggio PD-808 grossing 14,464 lbs. Floyd C. Newton, project engineer, said the prototype is under construction in Italy, with deliveries late in 1963 at $500,000.

Newest prop-jet announced at the meeting was promised by Leddy Greever, vice president-domestic sales, Beech Aircraft Corp. The decision to announce it was made only days before the NBAA meeting and Greever was unable to outline details because all of them had not been settled. But the twin-prop-jet Beech will carry 6-8 persons over 300 mph., will have a range exceeding 1,500 miles, and will be priced less than $400,000, with deliveries in 1964. He said complete details will be announced within 90 days, or around the end of the year.

Don Payton, president of Turbo-Flight, Inc., Chicago, described the 10-place executive transport version of the French-built Potez 840 which he will distribute in America. Powered by four 523-hp. Turbomeca Astazou turbo-props, it is priced at under $500,000 full-equipped with electronics and interior. Cruising speed at 20,000 ft. is 325 mph., and range is 2,000 miles with reserves. The Potez grosses 18,700 lbs. with basic empty weight (equipment included) of 10,916 lbs. and has a power loading of 9 lbs. per hp. and a wing loading of 50 lbs. per sq. ft. Cabin length is 35 ft. and cabin head room is 5 ft. 11 ins. Payton said overhaul life of the Astazou engine is 1,250 hrs. and estimated the overhaul cost of an engine at $3,000. He said fuel consumption at maximum cruise (4 engines) is 115 gals. per hr. Deliveries are available beginning in the third quarter of 1963. Payton expects to have his demonstrator next Spring.

NBAA members elected new officers, as follows: John H. Winant, Sprague Electric, North Adams, Mass., president, succeeding B. J. Bergesen, Ford Motor; E. M. Beattie, General Electric, executive vice president, and John G. Kruse, 3-M, treasurer.

NEW DEBONAIR

(Continued from page 26)

gyro horizon and directional gyro with complete vacuum system, instrument kit (includes electric turn and bank, rate of climb, clock, outside temperature and cylinder head temperature), 50-amp generator, right-hand rudder pedals, auxiliary wing fuel tanks, super soundproofing and Motorola T-12 ADF.

The "Power Flite Control" is a single-axis pneumatic autopilot customized for Beech by Tactair. If all of the equipment included in the package were purchased separately for later installation, the total cost, excluding the autopilot, would be $3,295, so that purchase of the factory-installed group includes the autopilot as a "bonus."

Hughes 269A—Just $22,500

Here is the soundly-engineered helicopter which cuts previous costs in half—with lower purchase price, 13-cent per mile total direct operating costs, greatly simplified maintenance. ▪ Designed and built by aircraft pioneers, the Hughes 269A saves you time, tension, trouble. You *enjoy* going *where* you want to go, *when* you want to go. ▪ Now sold and serviced by a growing network of dealers offering expert instruction and complete after-sale service. ▪ **Costs less to buy...costs less to fly!** Get all of the facts *now*. Wire or write: Commercial Helicopter Sales, Dept. 0211, Hughes Tool Company, Aircraft Division, Culver City, Calif.

Save time where it really counts—*door to door*. The 269A easily moves in and out of small 30-foot spaces. You fly *over* traffic tangles, go places impossible to reach otherwise.

Fixed-wing pilots make the transition with a minimum of instruction. Even non-fliers learn faster. Your dealer now offers instruction and flight time at 1/2 former helicopter rates.

Full 360° visibility all-around...extra-wide doors, special tinted canopy, plenty of leg, shoulder and head room, handsome interiors...all add up to relaxed, comfortable flying.

HUGHES
269A
THE COMPACT HELICOPTER

AIRWORK SYMPOSIUM

(Continued from page 18)

symposium is something to marvel at. It's "soft-sell" all the way and one would think the sponsoring organization was some kind of non-profit foundation instead of an aggressive commercial enterprise. At some time during the two-day gathering, nearly everyone makes a visit to the ultra-modern engine shops on the Millville Airport, where the advent of turbine power is everywhere in evidence. Airwork has invested nearly $1 million in its new turbo engine overhaul and test facilities. With the advent of Rolls-Royce Dart engine overhauls, Airwork has boosted gross in engine and accessory overhaul to its highest point in history — around $12 million plus for the past 12-month period. Expansion has been orderly and the ever-increasing volume of business at Airwork certainly testifies to the fact that quality is very much in demand by today's users of business aircraft.

Airwork's colorful display tent again offered a supermarket selection of accessories and components, including cutaway versions of Canadian P & W's and Continental's 500-shaft-horsepower turbines. Unseasonal muggy weather failed to affect attendance and more than 600 registrants topped all previous records.

Lunch in the open air was a treat for over 600 Airwork registrants.

Two symposium speakers, Dick Foster of Shell and Tom Dickson of Airwork issued advice on proper engine operation and pointed to the resultant savings in overhaul costs.

Arguing for lower engine crankshaft speeds, Foster said that the pistons in an R-2800 engine, during an average 1,500-hr. service life, would travel 5,114 miles less at 1,900 rpm. than they would at 2,200 rpm. "They're sliding miles, not rolling," he said. Advantages of reduced rpm's, he pointed out, are reduced friction, lower reciprocating and centrifugal loads, reduced detonation and improved cylinder and oil cooling.

Dickson, vice-president of Airwork, discussed turbine overhaul costs and warned turbine operators that "one momentary overheat can cost you $25,000." He explained that parts in the "hot section" of a gas turbine suffer greatest damage in overheat and are most often damaged during the starting cycle and on approach and landing.

"Quite frequently the tower will ask a pilot to hurry off the runway, and forgetting to put the prop in fine ground pitch will cause an overheat," Dickson explained. "The gauge always lags the temperature rise, so you've experienced greater heat at the turbine before the gauge shows it," he added.

Dickson said Airwork has been active overhauling, modifying and rectifying Rolls-Royce Dart MK6 and MK7 during the past year and "overhaul production is just now beginning to build up to the point where we will be doing 10-12 overhauls per month."

AIRCRAFTSMEN, INC.
Will Rogers Field
Oklahoma City, Oklahoma

ALAMO AVIATION, INC.
Municipal Airport
San Antonio, Texas

ATLANTIC AVIATION CORP.
- Teterboro Airport
  Teterboro, New Jersey
- Logan International Airport
  East Boston, Massachusetts
- International Airport
  Philadelphia, Pennsylvania
- New Castle County Airport
  Wilmington, Delaware

BUSINESS AIRCRAFT, INC.
9011 Randolph Street
Houston International Airport
Houston, Texas — MI 4-5595

CURREY SANDERS AIRCRAFT CO., INC.
Downtown Municipal Airport
Shreveport, Louisiana

CUTTER-CARR FLYING SERVICE, INC.
West Mesa Airport
Albuquerque, New Mexico

ELLIOTT FLYING SERVICE
- Municipal Airport, Des Moines, Iowa
- Municipal Airport, Davenport, Iowa

GRAY AIRCRAFT SVC. CO., INC.
D. A. Cody, Service Manager
Love Field, Dallas, Texas

HARTZOG AVIATION
Greater Rockford Airport
Rockford, Illinois

THE NORMAN LARSON CO.
PLANESERVCE, INC. (Service Division)
Van Nuys Airport, Van Nuys, Calif.
(Los Angeles Area)

PIEDMONT AVIATION, INC.
Smith Reynolds Airport
Winston-Salem, North Carolina

ROSCOE TURNER AERONAUTICAL CORP.
Municipal Airport
Indianapolis, Indiana

TEXAS AVIATION CORPORATION
G. K. Roberts, Pounds Field
Tyler, Texas

TOPEKA AIRCRAFT SALES & SERVICE
Municipal Airport
Topeka, Kansas

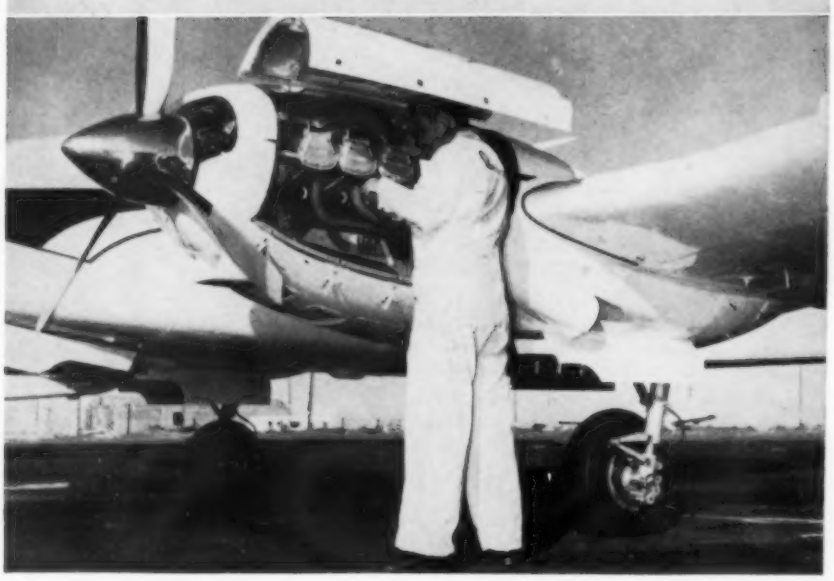
TRADEWIND AIRPORT CORP.
Tradewind Airport
Amarillo, Texas

TULSAIR DISTRIBUTORS, INC.
Hangar 8, Municipal Airport
Tulsa, Oklahoma

UNITED AIRPLANE SALES, INC.
New Municipal Airport
Wichita, Kansas

YOUNG AVIATION CORPORATION
Lambert Field
St. Louis, Missouri

CERTIFIED Beechcraft SERVICE



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Certified BEECHCRAFT Service offers many extras to the aircraft owner — extras that do not appear on the service or maintenance **bill.** But these extras can mean a big saving each year.

A good example of one of these extras is the CLOSE INSPECTION your aircraft and its accessories receive while it is being serviced on the ramp of a CERTIFIED BEECHCRAFT SERVICE STATION. Factory trained service personnel will spot — and call to your attention — any mechanism that is not functioning properly, thereby eliminating costly repairs later.

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Put Your BEECHCRAFT in BEECHCRAFT Hands

Put yourself here soon and discover why the Twin-Bonanza is the favorite of so many professional pilots. Note full dual flight controls and instruments, central location of engine instruments and radios.

Roomy Twin-Bonanza cabin seats 6 in typical Beechcraft comfort. Luggage is quickly accessible in flight.

The strongest, most ruggedly built airplane in commercial aviation, the Twin-Bonanza goes into and out of any field with ease, quickly tops terrain and most weather. Your choice of two proven Lycoming power plants.

What The Beechcraft Twin-Bonanza's Extra Strength And Reliability Mean To You These 3 Ways:

1. More "take it anywhere" utility: You don't have to pamper it. With its great structural strength, rugged wide-tread landing gear and high ground clearance, the Twin-Bonanza is as much at home on unimproved fields as it is on smooth paved runways.

2. Greater safety: The superior structural strength of the Twin-Bonanza (designed and tested to withstand in-flight loads equal to almost 7 times its own weight) gives you higher safe turbulent air penetration speeds than competitive aircraft.

3. More flying hours, fewer maintenance hours: Because the Twin-Bonanza is built to absorb more punishment than other airplanes, you can count on less down-time for maintenance and repairs.

But that's not all . . .

The Twin-Bonanza also offers you a big, comfortable cabin with center aisle, individual seating for 6, super-soundproofing, roomy baggage compartment accessible in flight, plus air-stair door for safe, easy entry and exit in any weather.

Visibility is excellent, for pilots and passengers alike. The big 50,000 BTU heating system keeps the cabin comfortably warm in any climate at any altitude. Optional appointments include work tables and couches. Aft-facing seats also available.

You owe it to yourself . . .

Before you buy any airplane of 6,300 to 8,000 pounds gross weight, you owe it to yourself and your company to see, fly, and get all the facts about the new Beechcraft Twin-Bonanza. Why not see your Beechcraft distributor or dealer soon?

Write today for latest information on low-cost Beech leasing and financing plans. Address: Beech Acceptance Corp., Wichita 1, Kansas, U. S. A.

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BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Needed: A Third Level Of Air Service

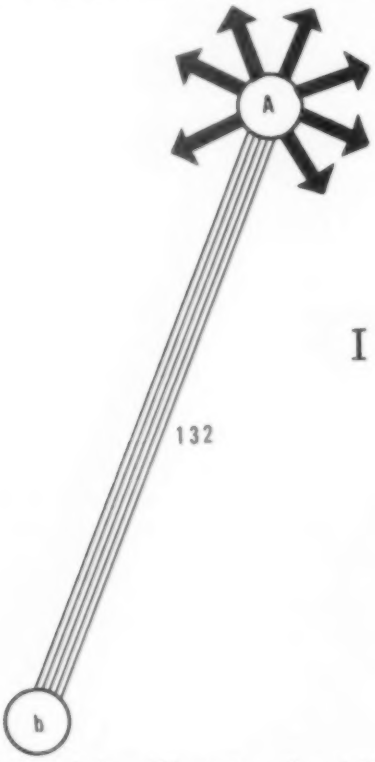
PART IV

By E. H. PICKERING

As stated in previous articles in this series, the direct operating costs for third-level airlines are readily computable once the variances of aircraft choice, pilot pay, fuel costs, etc. are determinted. These costs will run below 30¢ per revenue plane mile for a 6-7 place light twin.

An additional amount of 30¢ per mile has been mentioned as a maximum allowable figure to cover all indirect and overhead expenses. What, then, must be encompassed within this figure of an additional 30¢ per aircraft mile? Specifically, it includes rentals of buildings and office space; landing fees; salaries of supervisory and management personnel; legal and technical fees; travel expenses; telephone, telegraph, and other communications expenses (other than aircraft radio); stationery, printing, postage, office supplies, etc.; training expenses; janitor and cleaning costs; advertising and sales expenses; insurance (other than aircraft); memberships; taxes (other than aircraft fuel); and station operating expenses plus other items.

Personnel will be a big item in indirect expense. Some idea of the numbers of personnel involved can be obtained by analyzing the three hypothetical third-level route systems which are mapped on these pages, and which also show possible daily trip frequencies and point-to-point mileages. Each is based on an actual geographical area and an analysis of possible traffic flows that might require the trip frequencies indicated. But they are not identified. Pilots and mechanics have been computed as a part of direct operating expense and are not included in the following tabulations.



System I has 132 route miles, 1,320 scheduled miles per day and 38,500 completed miles per month average. Each line is a daily round trip. Arrows show connecting airlines.

Personnel requirements for Systems I, II and III respectively, shown on the accompanying maps, may be estimated as follows:

Management and General Office — General manager 1-1-1, sales manager 0-1-1, secretarial 1-2-2, accountants 1-2-2 and clerks 0-1-2; totals 3-7-8.

Operations Department — Flight superintendent 0-1-1, maintenance superintendent 0-1-1, maintenance foreman 1-1-1, maintenance inspectors 0-1-1, dispatchers 0-2-3 and cleaners 0-1-1; totals 1-7-8.

Main Base Station ("A" on maps) —Reservations superintendent 0-1-1, reservationists 0-2-2, superintendent of stations 0-1-1, traveling relief agents 0-1-2, and station agents 2-3-3; totals 2-8-9.

Secondary Stations (capital letters on maps) — Station manager 0-2-2 and agents 0-4-4; totals 0-6-6.

Smaller Stations (small letters on maps) — Station manager 1-6-6 and agents 1-6-6; totals 2-12-12.

Total personnel (other than pilots and mechanics) 8-40-43.

Route Selection Considerations

The route systems suggested by these maps represent typical examples of services that can be performed by third-level airlines.

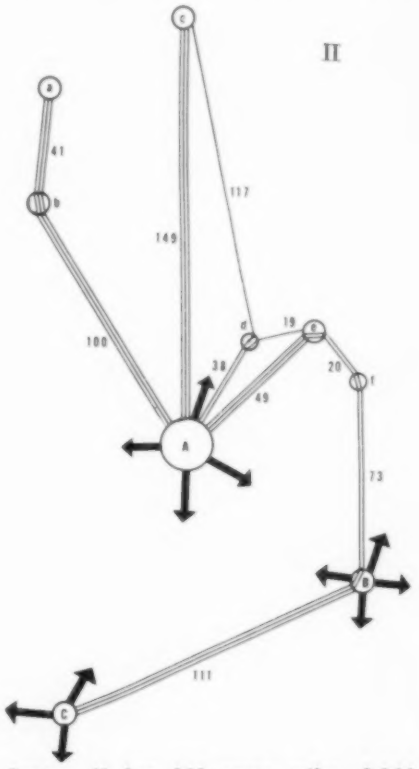
In System I, "b" is a small city with a military base. Its traffic must go 30 miles to an airport where three daily DC-3 flights operate to the major terminal "A". By offering direct, frequent service with smaller aircraft timed to the particular needs of "b", a much more useful service is provided.

In System II, major airline services exist between "A" and "B" and local service is provided between "A" and "C". No service is presently provided between "C" and "B", although "B" is a very logical gateway for "C" to use in reaching its primary market. This accounts for the three daily round trips proposed between "C" and "B".

In example II, flights are shown as making a "button-hook" pattern from "A" through "e," "f" and "B" to "C". Traffic from "A" would naturally flow to "e" and "f" but no further. At "e" traffic can be expected to develop to "B" as well as "f" traffic to "B". Continuation of the flights through "B" to and from "C" are an operational convenience rather than a traffic requirement.

Point "d" would be troublesome as an intermediate point on a flight between "A" and "c" because "A" to "d" passengers traveling only 38 miles would frequently block off the opportunity to carry more remunerative long-haul passengers to "c," a resort town. This type of situation should be avoided in most cases.

Points "a" and "b" appear to be about equally strong traffic generating points. Together they should be able to generate enough traffic to support three daily round trips, although separately neither could justify even two such trips. The 100-mile haul from "b" to "A" is sufficient to offset any



System II has 363 route miles, 3,044 scheduled miles per day and 88,783 completed miles per month average. Point-to-point mileages are shown. Each line is a daily round trip.

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HOmestead 5-1728
Austin, Texas

CATLIN AVIATION CO.
Will Rogers Field
P. O. Box 2398
MUtual 5-6644
Oklahoma City, Oklahoma

CUMMINGS & GROVES AVIATION, INC.
Houston International Airport, Hangar No. 8
MIssion 4-5593 *and OLive* 4-4351
Houston, Texas

DELAWARE AVIATION CORPORATION
North Philadelphia Airport
HObart 4-1600, *TWX PH* 520
Philadelphia 36, Pennsylvania

EXECUTIVE AIRMOTIVE, INCORPORATED
Stewart Air Park
P. O. Box 70
GArfield 8-3581, *GArfield* 2-7277
Parkersburg, West Virginia

J & J AIRCRAFT, INC.
Sarasota-Bradenton Airport
821 *General Arnold Road*
ELgin 5-6868
Sarasota, Florida

KEN-MAR AIRPARK, INC.
Ken-Mar Airpark
Box 2667, *University Station*
MUrray 3-6589
Wichita, Kansas

RED AIRCRAFT SERVICE, INC.
Broward County International Airport, Building 78
JAckson 3-9624
Fort Lauderdale, Florida

ROSS AVIATION, INC.
Riverside Airport
CY 9-5055
Tulsa, Oklahoma

losses from traffic that may be occasionally blocked out to or from "a". If "b" had been closer to "A" than to "a", then this route pattern would have to be altered or abandoned.

Example III has some interesting considerations. Point "b" seems likely to add just enough traffic to help justify a third round trip between "a" and "A" while the additional "a" to "A" traffic helps to justify the second round trip for "b".

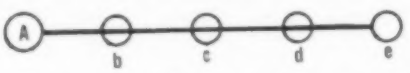
One-plane local-airline service exists between "a" and "c", but the demands of government offices at "B" could also justify local service to "c". However, no airline is interested in providing the service. Terrain makes surface travel difficult between "B" and "c" making this service a natural for a third-level airline. Because of the existing ser·.ce between "A" and "c", no through-plane service is proposed for the third-level airline which it could provide by continuing through "B". Incidentally, points "e" and "f" once received airline service. The airline presently serving point "B" has petitioned the CAB to suspend there, although it boards several thousand passengers a year at "B". It appears that the suspension will be granted because of the shortness of the 50-mile haul from "B" to "A".

"B" also has a community of interest with "d" and "e" and "f" which justifies its inclusion on flights between these points and "A".

Point "C" has only a very minor community of interest with other points on the system, but industrial establishments located at "C" generate substantial airline traffic to such cities as New York, Los Angeles, San Francisco, Washington, etc. A third-level airline with frequent service over the 60-mile leg to "A" stands to generate nearly 30,000 passengers a year for trunk airline connections at "A". Much of this travel is now being handled by company planes. These concerns would welcome a dependable, frequent third-level airline service.

It will be noted that dog-legging of routes has been avoided because of costs involved in extra flying plus passenger resistance to extra time.

Generally, with these smaller aircraft, a linear route with more than one intermediate point such as shown below should be avoided.

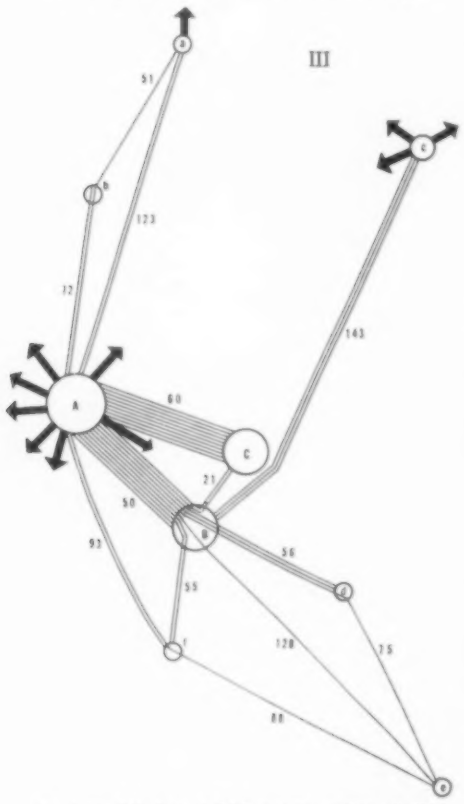


In this type of route, where most of the traffic is into and out of "A", every passenger between "A" and "b" blocks out a potential sale to more lucrative travelers to the points beyond "b." If a flight departs "A" with 4 passengers, one to each point, the average load over the entire route is only 2½ passengers. If it's a 6-passenger twin and the distance between each point is 25 miles, then 600 seat miles are operated, but only 250 passenger miles are generated for a 42% maximum load factor. If a request were received for two seats from "A" to "e", these two $10 fares would have to be refused because a $2.50 sale to "b" had blocked out the sales opportunity.

For such reasons as this, multi-stop linear routes are usually to be avoided. If no two outlying stations can generate enough traffic to warrant service, then the addition of two more such weak points only complicates matters. All four outlying points were considered as approximately equal in traffic generating capabilities. However, if point "b" is a stronger point, then it will block the long haul traffic more often. If point "e" is stronger, then the other points will frequently be denied service by passengers at "e".

If there is enough traffic at these points to justify service at all, two route patterns that would serve "b" and "c" on one flight and "d" and "e" on another would seem preferable. Service to "d" and "e" would be faster and attract more passengers.

These three route systems, if operated with six-passenger light twins at the costs previously estimated and with average passenger loads of four passengers, could show profits of from 2½¢ to 7½¢ per mile under the type of subsidy computation discussed in the October issue of FLIGHT. Annual gross profit for any one of the operations would be under $50,000. It is certainly not a method for getting rich quick. It is, however, a sound adjunct to a fixed-base operation while providing an appreciated and valuable public service.



System III has 1,015 route miles, 5,534 scheduled miles per day and 161,408 completed miles per month average. Each line is a daily round trip.

NEW MOONEY MARK 21

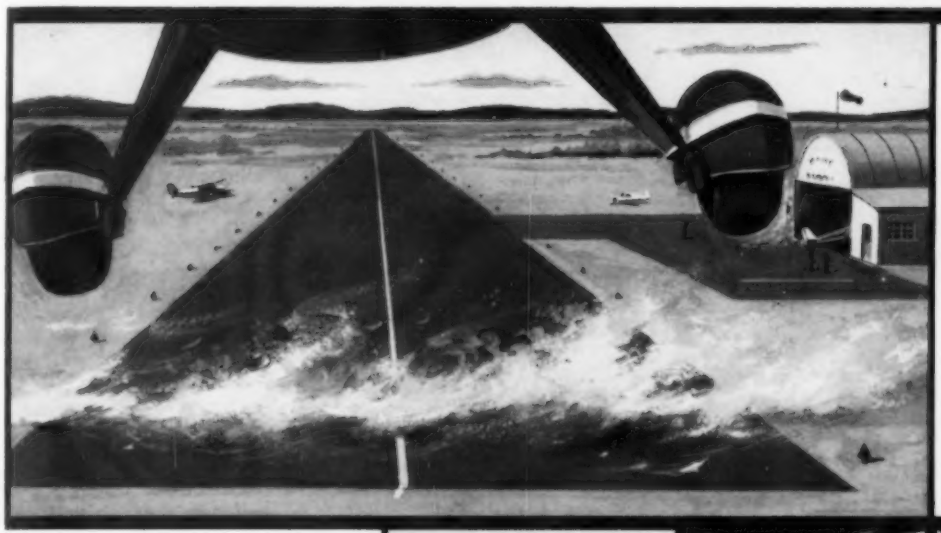
(Continued from page 25)

and has the additional capability of righting the airplane from an inverted position. It has a memory circuit providing accurate return to the original heading when directed off course. Mooney says it is capable of employing additional circuitry to be offered by ARC.

The pictorial artificial horizon is designed for easy interpretation, incorporating a grid of lines for the desired degree of nose attitude and bank. It also incorporates lights to warn when the amount of vacuum is too high or too low. This instrument is one of several new Garwin devices used. The new electric turn and bank also has a power adequacy meter. The engine instrument cluster is an innovation and the manifold pressure gauge is combined with the fuel pressure gauge for easy surveillance.

NEW GARWIN ENGINE GAUGE CLUSTER in new Mooney Mark 21 is only 3 ins. high by 4.5 ins. long and 3 ins. deep but contains 6 aircraft-quality instruments. Front and rear views of unit are shown. Accuracy standards exceed those of automotive gauges used in some aircraft.

WING TIPS



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While making your approach, keep a keen eye out for low level, wind-blown dust near the runway. If it's moving in a different direction than the wind sock, you should expect turbulence or cross winds as you're touching down.

TUCK IN BEFORE TAKE-OFF!

Sounds fantastic, but many a carefree pilot has taken off with a seat belt dangling out the door of his plane. In flight, a dangling seat belt can create terrific noise – even damage – as it raps against your fuselage. So keep seat belts inside . . . and fasten 'em!

MEET A NEW OIL THAT'S ASHLESS!

New Esso Aviation Oil E is an ashless dispersant oil. Because it reduces engine deposits, it helps reduce engine wear and oil consumption. New Esso Aviation Oil E has been cleared for use by every major U. S. aircraft engine manufacturer. Next time you land, taxi over to the Esso Sign.

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New Business In The Hangar

EXECUTIVE AIRCRAFT SERVICE, REDBIRD AIRPORT, Dallas, received Procter & Gamble's DC-3 from Chief Pilot Nelson U. Rokes for stainless steel flight control cables, a new EAS interior and other work. . . . Mead Johnson's Convair 440 was brought in by Chief Pilot Jack Jones for repair work. . . . Charlie Baudoux and Tommy Armistead flew in the S. B. Burnett Estate Lodestar for tail section modification . . . the Parker Drilling Company Lodestar was in the hangar for an alternate fuel system and other work. . . . **LOVE FIELD BRANCH** received E. P. (Cotton) Jeter's Union Producing Grumman Gulfstream for engine modification and their E18 for minor work. . . . Capt. Alberto E. Aquilar of Tampico, Mexico, brought in Perforado Cerro Azul's G18 Beech for work. . . . The Shamrock Oil & Gas Convair 240, first aircraft to receive a complete modification from Service City, U. S. A., was in for overhaul, maintenance and paint job. Interior, engine, instrument and radio work was accomplished by other members of the Service City team which includes Associated Radio, Southwest Airmotive, and Aero Instruments . . . also in for work were Pete Carney's Gulf States Utilities E18 and V. W. Head's Dresser Industries DC-3.

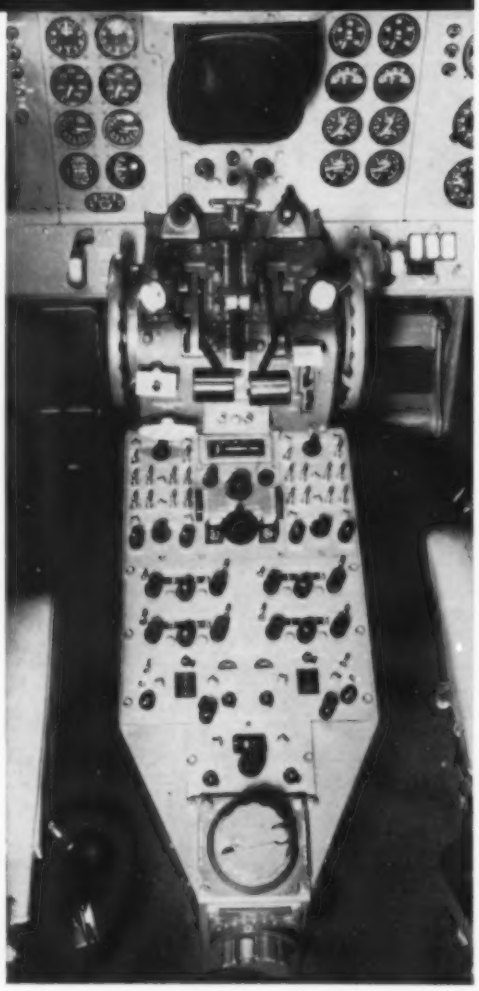
REMMERT-WERNER, INC., Lambert Field, St. Louis, Mo., received General Insuror's Aero Commander for complete repaint. Walter Westerfield is pilot. . . . The National Brewing Convair was flown in by John Trotter for an APU installation. . . . Hackett Engineering's DC-3, brought in by John Gildea, had a Bendix RDR-1D radar installed. . . . C. S. Fuller's Donovan Wire and Iron DC-3 received an ARC-210 VHF. . . . Monsanto Chemical's second Convair has been converted to Skydrol fire-resistant hydraulic system, and an electric flushing toilet was installed. Ralph Piper is the chief pilot. . . . The Schenley Industries' Convair was flown in by Gus Rahm for a double engine change, accesssory and compressor overhaul, engine mount magnaflux, propeller overhaul, paint, and installation of Atkins high intensity strobe lights.

DALLAS AERO SERVICE, Love Field, Dallas, received Bodcaw's D-18 Beech for angle of incidence change, air stair door, extended tail gear and a new interior. . . . Parker Equipment's Lodestar was in for new-type wingtips. . . . Two other Lodestars in the hangar were the Stringair airplane, for fuel tank reseal and miscellaneous maintenance, and one belonging to Howell Instruments, in for fuel flow meters, feathering pumps and direct-drive starters. . . . Armstrong — Armstrong's Aero Commander was flown in for double engine overhaul . . . and the State of Alabama's Twin Beech was in for engine overhaul.

FRANK SINATRA'S MARTIN 404 is being converted to a "virtual private club with wings" by AiResearch Aviation Service, Los Angeles International Airport. AiResearch calls the conversion its "most colorful and imaginative," and reports that interior plans include an electronic piano, 96 "star" lights to twinkle down on an angled refreshment bar, AM-FM radio and tape recorder, a den-type compartment with shuttered swinging doors at the compartment's entrances, and other exclusive niceties. Along with this work, AiResearch is also giving the plane a major inspection and overhaul, installing an auxiliary power unit, and doing miscellaneous radio work. AiResearch also reports having sold 31 sets of performance-improving DC-3 Maximizers for $300,000 to Air France. The sale followed a French ruling that the takeoff weight of all DC-3 aircraft be reduced unless single-engine climb performance was improved. The Maximizer will allow continued operation of the French DC-3's at 28,000 lbs. with 20 mph. speed increase. . . . Hal Seigenfield recently flew in the General Dynamics Astronautics' Convair 240 for installa-

COMPARE

Custom Installations



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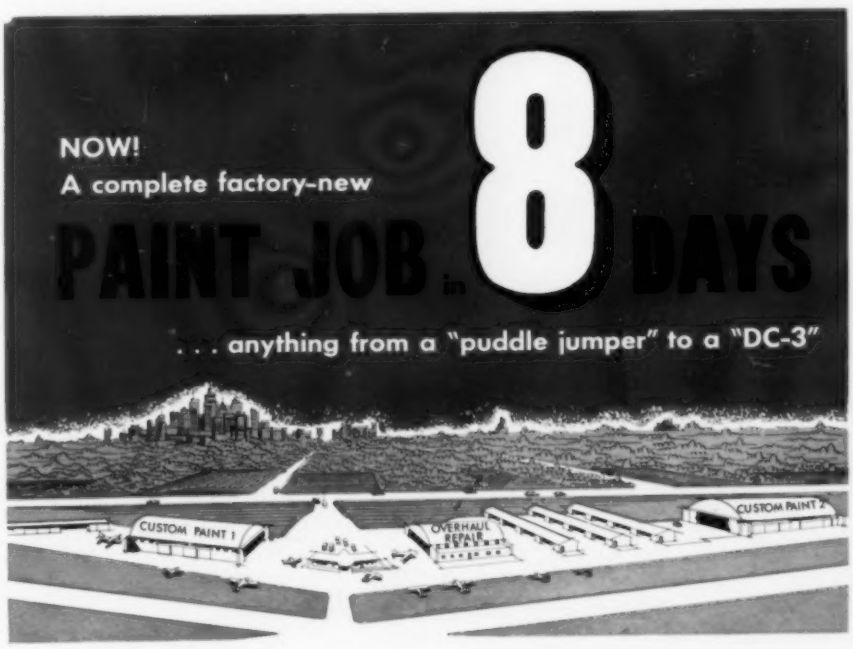
tion of Collins dual VHF communication and navigation systems, dual Collins glideslope system, rewiring present dual ADF, rework of instrument panels, Convair Service Bulletin compliance, some interior work and exterior painting. Earlier, Seigenfield had brought in another CV-240 for a single engine change. . . . Two Trans International Airlines Super H Constellations were in for installation of combination cargo-passenger interior configurations, exterior painting and miscellaneous maintenance. . . . Arctic Research Laboratory of Barrow, Alaska, had its second R4D-5 flown in by Lloyd Zimmerman for major structural repairs on the center section and fuselage, installation of outer wing panels adding 400 gals. fuel capacity, de-icer boots, radio gear and exterior paint. . . . Jim Ketner's Texas Eastern Transmission Learstar was down for single engine change, interior refurbishing and exterior painting. . . . Tennessee Gas Transmission sent its Viscount in for installation of a ground cooling fan. Tony Zuma is chief pilot. . . . Tom Penfield's LaBrea Securities Lodestar, W. W. Bartlett's Gibbons & Reed Aero Commander and William Shannon's Servo Mechanism Apache were in for work.

CALIFORNIA AIRMOTIVE CORP., Burbank, has announced sale of a Martin 404 to Aerojet General Corp. of Azuza, Calif., for executive and corporate use. . . . the firm also sold a Martin B-26 to Bacon Aircraft Co., Thermal, Calif., for use in Mexico. . . . World Airways, Inc., Oakland, Calif., brought in their Lockheed 1049-H for wing repairs, passenger interior and modification of wings to increase gross takeoff weight. . . . Two Trans International Lockheed 1049-H aircraft were in for routine maintenance. . . . Associated Air Transport's Lockheed 749-A was in for radio installation. . . . The California firm also announces the appointment of John B. Muoio as organizer and director of their Material and Production Control Department.

QUALITRON AERO, INC., Burbank, Calif., reports it is installing radar systems featuring a unique scope mounting device in two Richfield Oil DC-3's. Joe Brown and Howard Flora are chief pilot and maintenance chief for Richfield. . . . Terry Atkinson's Englund Company Twin-Bonanza was in for installation of new communication and navigation equipment and panel modifications. . . . R. L. Manning's Twin Beech was flown in by Chief Pilot Doyle Grout for interior refurbishing, as was R. L. (Bob) Daniel's Bendix Navion. . . . Malcolm Neal, Qualitron Aero manager, reports an increase in light twin servicing in the past few weeks, including work on Aero Commanders belonging to T. J. Bettes, Del E. Webb Construction, Shaffer Tool and Royal Industries and Avtel Corp.'s Cessna 310.

FIRST LOCKHEED JETSTAR CUSTOM INTERIOR BY HORTON-HORTON, Ft. Worth, was installed last month for Krupp of Germany, and Horton also painted the 500-mph. jet. Pilots are Marcel Jacob and Dieter Bosse. Other JetStars scheduled for H-H interiors will be for Harold Vanderbilt, an Italian oil firm and Corning Glass. Two Lockheed engineering pilots, Ted Limmer and Bernard Dvorscak, piloted the Krupp JetStar to Ft. Worth for the Horton-Horton work.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Airnews, Inc.
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San Antonio, Texas

Champ's Aviation, Inc.
Municipal Airport
El Paso and Lubbock, Texas

Clinton Aviation Company
Stapleton Airfield
Denver, Colorado

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ELECTRONIC PROP SYNCHRONIZER for light twins will be available from Woodward Governor Co. in early 1962. Shown is its control box, measuring 5 by 6 by 1⅛ ins. Weighing less than 5 lbs. installed, the new Woodward synchronizer provides exact matching of the rpm. of both engines. Electric pulses from each prop governor are "compared" in the unit, any difference causing an actuator motor to reset the "slave" engine governor rpm. to match the "master" engine governor rpm.

HOWARD AERO OF SAN ANTONIO SOLD TWO HOWARD 250'S, one to Life & Casualty Insurance of Nashville, Tenn., the other to Better Industries of Pueblo, Colo. Chief Pilot Bob Stone received Life & Casualty's airplane. . . . Petan Corp.'s Howard 500 received wing and flap modifications and under-wing exhaust. . . . Schlumberger's Twin-Bonanza was in for Jato installation and glue-on deicer boots. . . . Jim Barber's Storer Broadcasting Lodestar was in for dump chute removal and annual inspection. . . . Leo Scheberle flew in Better Industries' Twin-Bonanza for new paint. . . . National Steel's Lodestar received flap speed restrictor installation and heater repairs after being flown in by Chief Pilot Bob Hamilton. . . . Tommy Teate's Volusia Locations Howard 500 was in for underwing exhaust and inspection. . . . The Northern Natural Gas' Howard 500 was flown in by Chief Pilot Eddie Custer for underwing exhaust, flap modifications and 100-hr. inspection. . . . Hunt Oil's Super Ventura, flown by Jake Cobb, was in for radar installation and inspection. . . . Fred Clayton's Parker Equipment Lodestar in for gear door installation and hydraulic modifications. . . . Also in the hangar were George Rueda's Tubacero S. A. Twin Beech, Bill Jessup's Rodman Supply Lodestar, Weatherhead's Lodestar, Western Pipeline's Lodestar, Frontier Chemical's Lodestar, and Williamson Dickie's PV-1.

ASSOCIATED RADIO SERVICE CO., Love Field, Dallas, received Shamrock Oil & Gas Co.'s Convair for modification and installation, including Collins DME and transponder, WP-103 Radar, and ARC 210 and CD-1 systems . . . the firm installed DME systems in Joe Betty's Upjohn Gulfstream, Col. Dick Barrett's Louisiana Dept. of Public Safety Twin Beech, Mead Johnson's Convair and DC-3, both flown in by Jack Jones, Saladmaster's Cessna 310, Jim Hopkins' American Can Gulfstream. . . . Tony Zuma of Tennessee Gas and Transmission brought in his Viscount for extensive modification and installation of Collins Doppler and Navigation System. . . . Bill Brand's James S. Harrison Beech was in for complete rewire, modificaton and installation, including Collins transponder, Narco DME, ARC 210, and Collins Omni systems. . . . Complete rewire and modification were done on Mobil Oil's Aero Commander, which also received installation of Collins 618F, ARC ADF-21A and 15E Omni systems. Capt. Jose Pratt's Comision Federal de Electricidad DC-3 was in for service of radio and electronics gear, as was Bob Ulch's California Co. B-23 and Humble Pipeline of Houston's Beech.

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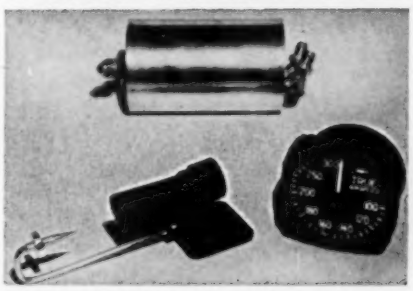

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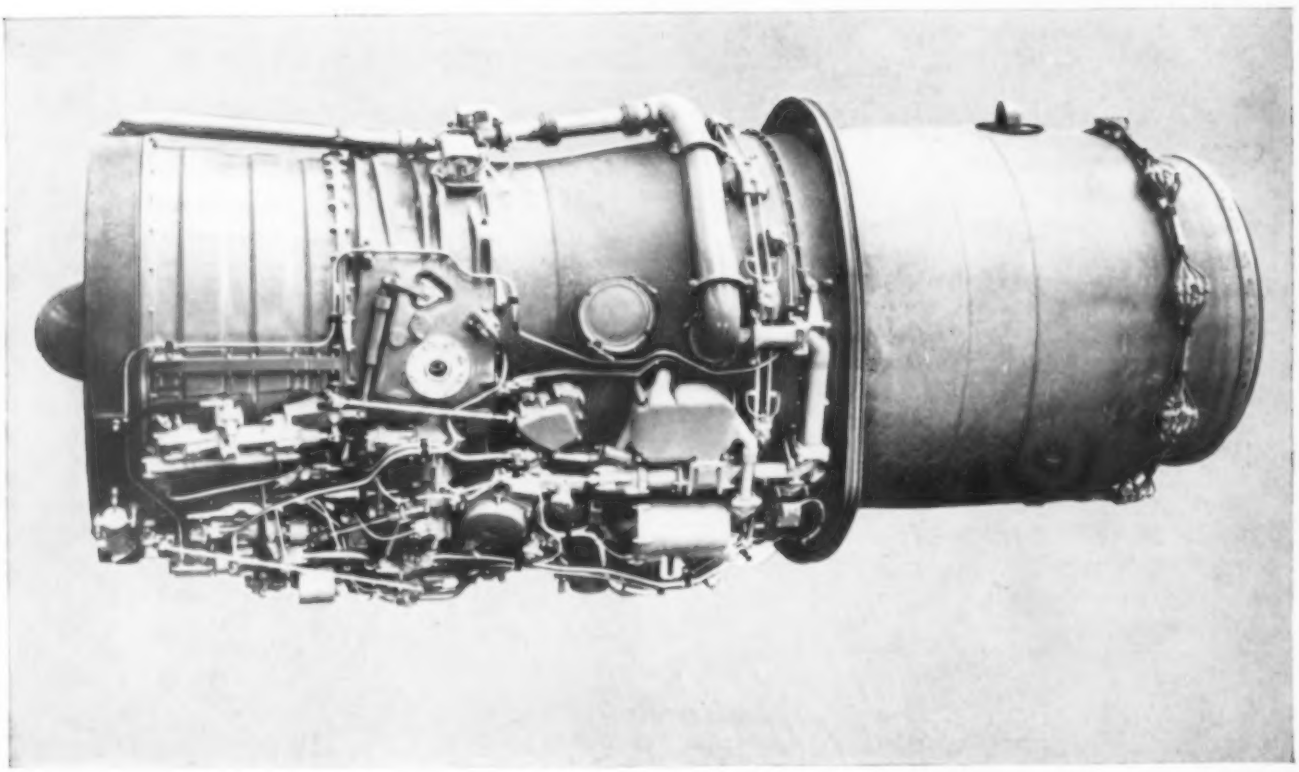

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